THE MEDICAL JOURNAL OF AUSTRALIA

VOL. I.—31ST YEAR. SYDNEY, SATURDAY, APRIL 1, 1944. No. 14.

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EXPERIMENTAL DIABETES.

By A. B. CORKILL, P. FANTL AND J. F. NELSON,

From the Baker Medical Research Institute, Alfred Hospital, Melbourne.

RECENTLY some interesting reports[1] have appeared concerning the action of alloxan (an oxidation product of uric acid) in producing necrosis of the islets of Langerhans. In brief, it has been found that the intravenous injection of alloxan into rabbits is followed by transitory hyperglycæmia; this is replaced by a stage of pronounced hypoglycæmia lasting from twelve to twenty-four hours. Hypoglycæmic convulsions ensue and there is a fatal outcome. Post-mortem examination reveals necrotic changes in the islets of Langerhans. This action of alloxan appears to be selective, since only minor changes are found in other organs.

It has been suggested that the initial hyperglycæmia is of a non-specific nature, somewhat similar to that seen after sulphydryl compounds and due to adrenal stimulation. Since we found that ergotoxine abolished this initial hyperglycæmia we are inclined to favour this view.

Bailey and Bailey[2] injected rabbits with alloxan, but prevented them from succumbing to the resultant hypoglycæmia by injecting glucose. On recovery the animals were permanently diabetic, and insulin was necessary to keep them alive.

The following is a description of another method evolved in this institute for the production of diabetes in rabbits. In the experiments previously referred to considerable amounts of alloxan were injected; thus, Bailey gave 200 milligrammes per kilogram of body weight. Theoretically, by injecting a series of smaller doses of alloxan, it should be possible to produce islet necrosis without producing acute hypoglycæmia. This procedure was adopted.

Experimental Investigation.

Alloxan monohydrate was prepared according to the method of McElvain[3] by oxidation with chlorine of a suspension of uric acid in acetic acid. The crystals were washed with glacial acetic acid and dried *in vacuo* over sodium hydroxide. Table I shows the experimental procedures and the results obtained on two rabbits.

Comment.

We were rather surprised when, after only two relatively small injections of alloxan, the first rabbit developed diabetes. This animal at no time showed any clinical signs of hypoglycæmia, although on the second day the blood glucose level was 0·056. From then on the blood glucose level steadily rose. In this particular case we should be inclined to suggest that the dosage of alloxan, although not large enough to produce a severe hypoglycæmia, was sufficient to induce a gradual necrosis of the islet tissue.

There may be a different explanation for the behaviour of the second rabbit. In this case two injections of the same order as those given to the first rabbit failed to evoke a diabetic response. However, diabetes followed the injection of a large dose that we should expect to have caused hypoglycæmia. It is possible that the first two injections may have greatly diminished the insulin content of the pancreas, so that there was insufficient at the time to precipitate a hypoglycæmic state, and the only effect of the third injection was to cause necrosis of the islet tissue.

Alloxan and Glucose Utilization.

The question then arose as to whether alloxan *per se* directly influenced the utilization of glucose. It seemed necessary to clarify this point in order to be certain that the hypoglycæmic effect of alloxan was confined to the liberation of insulin. Obviously it is impossible to decide

provisions of the *Workers' Compensation Act* the money was available for rehabilitation. Possibly the insurance companies would be interested. Dr. Nelson then referred to Dr. Stormon's remarks; Dr. Stormon, he knew, worked in a happy atmosphere with good teamwork. Dr. Nelson had been amused to hear a denial of the existence of oil dermatitis. The occurrence of acne on the thighs was well known. Dr. Nelson simply called it oil dermatitis, and did not even bother calling it folliculitis. Dr. Nelson then referred to Dr. Brown's remarks about the personnel officer who carried out his investigations even into the private lives of the workers. Dr. Nelson had recently been in another city and had discussed the matter with the heads of several large manufacturing plants. They were opposed to preemployment medical examination, because of the hostility of the trades unions. With regard to the welfare of the workers outside the factories, they were strongly opposed to any such activities on the part of the personnel officers, and they had adduced good reasons for their attitude. Not everybody was in agreement with the principles in operation at the factory described by Dr. Brown. Dr. Nelson then referred to the question of returned soldiers reentering industry. He said that he was connected with several factories in which the management was keen to have back the men who had gone to the war. These men were looked upon as the backbone of the industry. In conclusion, Dr. Nelson said that he appreciated the honour of being asked to address the meeting, and he looked upon the task as a professional duty, because at present there was nothing more important on the medical horizon than the rehabilitation of industrial medicine itself.

Dr. Brown, from the chair, said that those present were indebted to Dr. Nelson. Dr. Brown hoped that the Branch Council, when it considered the programme for 1944, would put on the subject again for discussion, and that the 200 or 300 medical practitioners interested in it would be able to be present. Dr. Brown, on behalf of the Branch members, thanked Dr. Nelson and those who had taken part in the discussion.

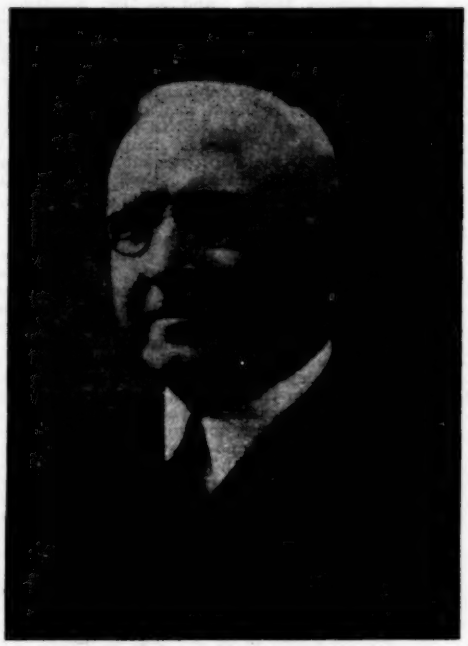
Obituary.

JOHN RAMSAY.

WE are indebted to Dr. C. Craig for the following appreciation of the late Sir John Ramsay.

The death of Sir John Ramsay closes a long era in the history of the Launceston General Hospital and a long era also in the history of surgery in Australia. Ramsay first came to the Launceston General Hospital as a house surgeon in 1896. The then surgeon superintendent was Dr. Drake. Drake was the first man to introduce big surgery to Launceston. He is also believed to have been one of the first, if not the first, to use X rays in Australia. He was in England when Röntgen made his discovery in 1895, and he brought back with him an X-ray machine which was installed at the General Hospital, Launceston, in 1896. Ramsay benefited greatly by the teaching of Drake and soon showed an extraordinary aptitude for surgery. When Drake resigned in 1898 Ramsay became surgeon superintendent, although he was then only twenty-six years old. There then began a golden age in the history of the hospital, an age of extraordinary expansion in surgery. The new surgery that followed the discoveries of Lister was at that time just coming into its own. In Australia the development of this surgery was in the hands of a small group of men, mostly working in one or other of the big teaching hospitals. Ramsay was practically the only surgeon working in an outside hospital whose work was recognized as being of the same standard as that done in the teaching hospitals. Between 1898 and 1912 everything of note that he did was written down and published. On many occasions he journeyed to the mainland centres to give papers on surgical subjects. A few weeks ago a full bibliography was published in THE MEDICAL JOURNAL OF AUSTRALIA. In 1906-1907 he collected funds from the public and built a magnificent theatre which has only just been pulled down. It is very interesting to note, in view of the modern trend of ideas in regard to asepsis, that this theatre had a plant attached to it for purifying and filtering the air that entered it.

He went into private practice in 1912, and although this benefited the public of Tasmania, there is no doubt that it was a great loss from the scientific point of view, as from that time onwards he published practically nothing. He remained attached to the hospital as honorary consulting surgeon. In 1921 he was appointed as a member of the board of management of the hospital. The year 1933 saw the commencement of another golden age for the hospital when he became chairman of the board of management, which position he retained until his death. Under his management everything in connexion with the hospital bloomed remarkably. Auxiliary societies were formed on all sides. The internal management of the hospital was completely overhauled and renovated. Finally, a completely modern hospital was built. This latter move was, of course, one initiated by the Government, but Ramsay played a great part in its development.



He was a man of extraordinary personality and there was nothing with which he was associated that did not become a success. In any medical assembly he was always an outstanding figure and a centre of interest. In spite of his power of domination he always chose to rule by the methods of consultation rather than by those of dictation, and a great deal of his success was due to his skill in moulding opinion before he finally launched a new project. In the months before he died he had made his great object the building up of a medical reference library in Tasmania, and it is to be hoped that this object will gradually be attained.

He was a big man for the community in every way and his loss will be felt for many years to come.

DR. J. A. NEWELL writes: By the death of Sir John Ramsay Tasmania has lost one who was an outstanding personality, both as a surgeon and as a citizen.

Graduating when surgery was in its infancy, he was to see the evolution of surgery to its present-day efficiency. He took a creditable part in that evolution in Australia.

He was a man of extraordinary enthusiasm and had a great capacity for work. He spared no effort to keep himself abreast of new departures and advances in surgery, and as far as practicable, putting them to a practical test. His visits to continental and American clinics made him conversant with the methods and technique of the world-renowned surgeons. He insisted on possessing the most modern surgical equipment and had built up a large medical library.

His pioneer work in local anæsthesia, the continuous saline drip, and X-ray diagnosis was a pleasant memory to him in

his later years. Hospital administration and construction were of great interest to him during the whole of his professional life, and the development of the present Launceston General Hospital and its efficiency are in a large degree due to his efforts.

Only three months ago he celebrated the fiftieth anniversary of his graduation, an event which brought to him much pleasure and satisfaction and hearty congratulations from his colleagues. One of Ramsay's characteristics was his insistence on keeping the closest personal touch with his patients. His meticulous care of, and attention to, the post-operative patient always excited admiration, and must have conduced materially to the success of his surgery. This conscientious thoroughness with which he performed his work did not relax even in the minutest detail. His wholehearted and inexhaustible enthusiasm was a constant stimulus to his fellow practitioners, who were never denied the benefit of his experience. A clear and logical thinker with an unbounded confidence in his own judgement, he followed tenaciously the course which he considered to be right. His high ideals of professional ethics and conduct earned for him the respect of his professional brethren. Ramsay was a man of dominating personality, but of a kindly and sympathetic disposition, which won for him a familiar and affectionate popularity. He had a keen sense of humour and enjoyed congenial company.

Outside his professional work his interests were wide and varied. He was a sound business man and an enthusiastic Rotarian. He was the moving spirit in the Saint John Ambulance Association for many years. In his earlier years Ramsay was as thorough and vigorous in sport as in his professional work. He was a good golfer, an exceptional billiardist, and a hard-hitting batsman.

To those of us who knew him so well over the past years, Ramsay's life appears as one of solid achievement. His sterling qualities and genial personality will remain as guarded memories. His wife and family have our sincere sympathy.

DR. W. P. HOLMAN writes: It is difficult enough to find words suitable to describe the loss of a truly great personality to a large community. Still harder is it to set down the intimate and personal way the death of Sir John Ramsay is felt in northern Tasmania.

Sir John was best known as a surgeon and a hospital administrator, as others will record—but it will serve as an indication of his capacity that in 1923 he visited Frankfurt to investigate the early large claims of deep X-ray therapy and rightly at the time decided against installing the equipment in his hospital. His critical interest in radiotherapy was not discouraged, and it was with some pride, as chairman of the Launceston General Hospital, that in 1937 he watched over the organization of its first-class radiotherapy department.

When the writer became his assistant in 1925 he found a modern thirty-bed private hospital which Sir John had built, fully equipped for diagnostic radiology, standard clinical biochemistry and bacteriology, with a microtome for section cutting, and let it be said—a lift!

In the operating theatre this courageous and enterprising surgeon introduced techniques he had learned from Moynihan, Crile and the Mayos, whose autographed books stood on his shelves as an endorsement of his professional standing.

His patients soon came to know that when things were going badly, a couch would be provided not far from the ward and John Ramsay would quite literally be there to carry the fight on with all his powers. His reputation is perhaps highest with his own nursing staff of those years.

It is rather unlikely that any busy surgeon kept a larger or more used library and few worthwhile advances escaped his early notice.

Outside his profession he was a giant in the community. In business his counsel was sought and respected. The list of companies he helped to direct is not required here. Yet he found time for other activities, and when any social organization of value was started his name was usually recorded as first president. Rotary will serve as a good example.

Finally, he was a sociable man and liked nothing better than good company. How many will remember his laugh! His knowledge of men, his wide reading and his cool judgement could easily be detected, but these are not unique. Yet in this community he was unique. The indefinable extra qualities of John Ramsay cannot be summed up. Now we have lost him we begin to know them.

Post-Graduate Work.

WEEK-END COURSE AT ARMIDALE.

THE New South Wales Post-Graduate Committee in Medicine announces that, in conjunction with the Northern District Medical Association, it will hold a week-end course at Armidale on Saturday, April 22, and Sunday, April 23, 1944. The programme is as follows:

Saturday, April 22.

At the Literary Institute, Armidale.

2 p.m.—"Non-Tuberculous Diseases of the Lungs": Major G. C. Moss.
3 p.m.—"Painful Feet": Dr. J. W. Hoets.
4.30 p.m.—"The Rh Factor in Obstetrics": Dr. H. B. Williams.
5.15 p.m.—"Neurological Hints": Major G. C. Moss.
8 p.m.—"Ante-Partum Hæmorrhage": Dr. H. B. Williams.

Sunday, April 23.

At the Literary Institute, Armidale.

9.30 a.m.—"Cardiac Disorders": Major G. C. Moss.
10.15 a.m.—"Bone Infections": Dr. J. W. Hoets.
11.30 a.m.—"The Use of Drugs in Obstetric Practice": Dr. H. B. Williams.
2 p.m.—Inspection at the Hinton Art Collection at Armidale Teachers' College.

The fee for the course will be £1 1s., except for members of the defence forces, who will be admitted free of charge. Those intending to be present are requested to notify Dr. R. J. Jackson, Honorary Secretary, Northern District Medical Association, Armidale, as soon as possible.

Correspondence.

OTITIS EXTERNA DIFFUSA: A PERSONAL EXPERIENCE.

SIR: It is always interesting for a medical man to experience in person some of the maladies for which he is constantly prescribing in others. I am only referring to minor ills and not those requiring, in the words of Oliver Wendell Holmes, that the "visitor become the visitee". In these, of course, we willingly hand ourselves over bodily to our colleague, follow unquestioningly his instructions and refuse to read his prescriptions on the principle that if we were not equal to treating ourselves we should at least not arrogate to ourselves the role of consultant. For minor ills, I might give as an example the "common cold", which the layman, not thinking medical assistance necessary, treats by a course of profanity, libations of rum engendering an aggressive irritability towards all who have the temerity to approach him.

Very different is the position of the medical man who with the whole pharmacopœia at his disposal sets out with relish to combat the infection. Having learnt from experience the necessity of early treatment, he starts off with a diaphoretic in the form of *Spiritus Ætheris Nitrosi*, and, borrowing from the homœopath, adds a minim of tincture of aconite, to be rewarded soon after by a relief from internal congestion—a pleasant feeling in the skin engendered by the slight diaphoresis and the satisfaction of soon knowing that his kidneys are busy eliminating toxic matter. At the right time and regardless of the expense of the half-finished bottle, he switches over to *Vinum Ipecacuanhæ*, and at once receives the benefit of its expectorant attributes and the satisfaction of knowing that in addition he is receiving a gastro-intestinal stimulant and cholagogue. He may also at this stage help the expectorant action of the first by adding a little *Vinum Antimonialis*, and at the same time benefit by its sedative effect on circulatory and nervous systems and its antispasmodic effect if he has spasms. At the appropriate time he will know that a stimulant expectorant in the form of squills is indicated, the tincture or *Oxymel Scillæ*, bearing in mind the incompatibles of the latter. He also has the comfort of knowing that his heart is receiving the benefit of a cardiac tonic. Soon the toughness and scantiness of the phlegm will inform him that ammonium carbonate is indicated and in addition obtain

relief from any digestive disturbance by its antacid properties. Finally, having reached the stage of the persistent irritable cough—known as a brassy cough—he knows that some opium derivative is indicated which by transmutation restores the silver quality of his voice and he is himself once more.

After these prolegomena I will proceed with the subject of this letter which I proved did not lend itself to self-treatment, for it is a strange fact that although the whole surface of the body is accessible to the hand except for a small area in the interscapular region, full 90% of the ills afflicting a medical man are out of range of both touch and sight.

Two articles appeared in your issue of November 27 by Dr. Davis and Dr. Earnshaw dealing with this ear trouble and the treatment of the established condition was both adequate and effective. I had been subject to such attacks recurring at intervals, and my ear was packed with gauze impregnated with ichthyol and glycerine, and I used to have a very uncomfortable week of it. I had been recommended to use 2% mercurochrome and derived no appreciable benefit once the auditory canal was inflamed. When a slight pain started in my ear I used to dread the inevitable week of pain and discomfort I knew was in front of me.

On one occasion when slight pain in the auditory meatus started I soaked a small pledget of wool on the end of a match in this 2% mercurochrome, inserted it into the meatus and pushed against the walls to allow some of the solution to run to the bottom of the meatus. To my surprise the attack was aborted and the treatment proved effective in preventing further attacks. I always carry the solution when travelling and have now no fears of diffuse external otitis becoming established, the remedy being applied in the way indicated at onset of slight pain or discomfort.

I think, therefore, that if this solution were given by the medical officers to any man complaining of pain in the external auditory meatus, the majority of the cases seen in the early stage would be aborted and thus save the patient from an attack and the medical officers the time and trouble of cleaning up the meatus.

Yours, etc.,

Undated. A. Campbell.

Naval, Military and Air Force.

CASUALTIES.

According to the casualty list received on March 17, 1944, Major J. R. Cornish, A.A.M.C., of Grassmere, South Australia, who was previously placed on the "seriously ill" list, is now reported to have been removed from all lists.

Australian Medical Board Proceedings.

NEW SOUTH WALES.

The undermentioned has been registered, pursuant to the *Medical Practitioners Act*, 1938-1939, of New South Wales, as a duly qualified practitioner:

Robertson, Athol Herbert, M.B., B.S., 1938 (Univ. Melbourne), H.M.A.S. *Kuttabul*, c.o. G.P.O., Sydney.

Books Received.

"Surgery of Modern Warfare", edited by Hamilton Bailey, F.R.C.S.; Sub-Editor for Medicine: C. Allan Birch, M.D., M.R.C.P., D.C.H., D.P.H., M.M.S.A.; 1944. Third Edition. (To be published in six parts.) Edinburgh: E. and S. Livingstone. Part I, compiled by seventy-six contributors, 8½" × 6", pp. 171, with 165 illustrations, many in colour. Part II, compiled by seventy-seven contributors, 8½" × 6", pp. 153-328, with 146 illustrations, many in colour. Price: 15s. net each.

"Pathology and Therapy of Rheumatic Fever", by Leopold Lichtwitz, M.D., with a foreword by William J. Maloney, M.D., LL.D., F.R.S. (Edinburgh), edited by Major William Chester, M.C.; 1944. New York: Grune and Stratton, Incorporated. 9" × 6", pp. 226, with illustrations. Price: $4.75.

"Fractures and Joint Injuries", by R. Watson-Jones, B.Sc., M.Ch.Orth., F.R.C.S. Volume II. Third Edition; 1943. Edinburgh: E. and S. Livingstone. 9½" × 6¼", pp. 411-960, with many illustrations. Price: 75s. net per set. Postage 1s.

"The 1943 Year Book of Urology", by Oswald S. Lowsley, M.D., F.A.C.S.; 1943. Chicago: The Year Book Publishers. 7" × 4½", pp. 416, with illustrations. Price: $3.00.

"The 1943 Year Book of Industrial and Orthopedic Surgery", edited by Charles F. Painter, M.D.; 1943. Chicago: The Year Book Publishers, Incorporated. 7" × 4", pp. 440, with many illustrations. Price: $3.00, post paid.

"Clinical Biochemistry", by Ivan Maxwell, M.D., B.S., M.Sc., B.Agr.Sc., F.A.C.I., F.R.A.C.P.; Fifth Edition; 1944. Melbourne: W. Ramsay (Surgical) Proprietary Limited. 8¼" × 5½", pp. 394, with illustrations, three pages of which are in colour. Price: 27s. 6d.

Diary for the Mo

Mar. 30.—New South Wales Branch, B.M.A.: Annual Meeting.
Mar. 31.—Queensland Branch, B.M.A.: Branch Meeting.
Apr. 4.—New South Wales Branch, B.M.A.: Council Meeting.
Apr. 5.—Victorian Branch, B.M.A.: Branch Meeting.
Apr. 5.—Western Australian Branch, B.M.A.: Council Meeting.
Apr. 11.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
Apr. 11.—New South Wales Branch, B.M.A.: Section and Science Committee.
Apr. 11.—Tasmanian Branch, B.M.A.: Branch Meeting.
Apr. 14.—Queensland Branch, B.M.A.: Council Meeting.
Apr. 14.—Victorian Branch, B.M.A.: Ethics Committee.
Apr. 17.—Victorian Branch, B.M.A.: Hospitals Subcommittee.
Apr. 17.—Victorian Branch, B.M.A.: Finance Subcommittee.

Medical Appointments: Important Notice.

Medical practitioners are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, 309 Pitt Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phœnix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Mutual Provident Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia.

Editorial Notices.

Manuscripts forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to The Medical Journal of Australia alone, unless the contrary be Stated.

All communications should be addressed to the Editor, The Medical Journal of Australia, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

Members and subscribers are requested to notify the Manager, The Medical Journal of Australia, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such a notification is received within one month.

Subscription Rates.—Medical students and others not receiving The Medical Journal of Australia in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £2 for Australia and £2 5s. abroad *per annum* payable in advance.

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EXPERIMENTAL DIABETES.

By A. B. CORKILL, P. FANTL AND J. F. NELSON,

From the Baker Medical Research Institute, Alfred Hospital, Melbourne.

RECENTLY some interesting reports[1] have appeared concerning the action of alloxan (an oxidation product of uric acid) in producing necrosis of the islets of Langerhans. In brief, it has been found that the intravenous injection of alloxan into rabbits is followed by transitory hyperglycæmia; this is replaced by a stage of pronounced hypoglycæmia lasting from twelve to twenty-four hours. Hypoglycæmic convulsions ensue and there is a fatal outcome. Post-mortem examination reveals necrotic changes in the islets of Langerhans. This action of alloxan appears to be selective, since only minor changes are found in other organs.

It has been suggested that the initial hyperglycæmia is of a non-specific nature, somewhat similar to that seen after sulphydryl compounds and due to adrenal stimulation. Since we found that ergotoxine abolished this initial hyperglycæmia we are inclined to favour this view.

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Comment.

We were rather surprised when, after only two relatively small injections of alloxan, the first rabbit developed diabetes. This animal at no time showed any clinical signs of hypoglycæmia, although on the second day the blood glucose level was 0·056. From then on the blood glucose level steadily rose. In this particular case we should be inclined to suggest that the dosage of alloxan, although not large enough to produce a severe hypoglycæmia, was sufficient to induce a gradual necrosis of the islet tissue.

There may be a different explanation for the behaviour of the second rabbit. In this case two injections of the same order as those given to the first rabbit failed to evoke a diabetic response. However, diabetes followed the injection of a large dose that we should expect to have caused hypoglycæmia. It is possible that the first two injections may have greatly diminished the insulin content of the pancreas, so that there was insufficient at the time to precipitate a hypoglycæmic state, and the only effect of the third injection was to cause necrosis of the islet tissue.

Alloxan and Glucose Utilization.

The question then arose as to whether alloxan *per se* directly influenced the utilization of glucose. It seemed necessary to clarify this point in order to be certain that the hypoglycæmic effect of alloxan was confined to the liberation of insulin. Obviously it is impossible to decide

TABLE I.

Intravenous Injection of Alloxan into Well-Fed Rabbits.

Number of Rabbit; Weight in Kilograms.	Day.	Time of Injection.	Amount of Alloxan Injected. (Milligrammes.)	Blood Sugar. (Milligrammes *per Centum*.)	Remarks.
Rabbit I; 1·75	First.	4.30 p.m.	100	—	
	Second.	9 a.m.	—	56	
		4 p.m.	—	156	
		4.30 p.m.	200	—	
	Third.	9 a.m.	—	84	
		4.30 p.m.	—	340	
	Fourth.	9 a.m.	—	210	
		4 p.m.	—	280	
	Fifth.	10 a.m.	—	360	Urine: Glucose ++. Ketones −.
	Eighth.[1]	9 a.m.	—	340	Urine: Glucose ++. Ketones −
Rabbit II; 2·15	First.	4.30 p.m.	100	—	
	Second.	9 a.m.	—	70	
		4 p.m.	—	145	
		4.30 p.m.	210	—	
	Third.	9 a.m.	—	115	
		4 p.m.	—	240	
	Fourth.	9 a.m.	—	140	
		4 p.m.	—	133	
	Seventh.	4.30 p.m.	430	—	
	Eighth.	9 a.m.	—	85	
		4.30 p.m.	—	435	
	Ninth.	9 a.m.	—	460	Urine: Glucose ++. Ketones −.
	Tenth.	9 a.m.	—	370	Urine: Glucose ++. Ketones −.
	Eleventh.[2]	9 a.m.	—	447	Urine: Glucose ++. Ketones ++.

[1] This animal was then stabilized on 16 units of protamine zinc insulin per day. After two weeks it was killed, and post-mortem examination showed that practically all islet tissue had disappeared.

[2] This rabbit was then stabilized on 16 units of protamine zinc insulin per day.

this in the intact animal, and accordingly the spinal eviscerated cat preparation of Dale was used. In this preparation the brain is destroyed under ether anæsthesia and artificial respiration is inaugurated. The viscera are then removed and the preparation can be regarded as one of muscle with its own intact blood supply. In order to maintain the blood sugar at a constant level an intravenous glucose infusion is given. It is known that sugar, disappearing under the action of insulin in such a preparation, is either oxidized or stored as muscle glycogen. If alloxan should decrease the blood sugar level in such a preparation, it is reasonable to assume that it should be accounted for in one of the ways discussed earlier. Actually, as shown by the following experiment, alloxan has no direct effect on the utilization of glucose. The subject was an eviscerated spinal cat, weighing 3·2 kilograms, and glucose was infused at the rate of 240 milligrammes per hour.

TABLE II.

Time.	Blood Sugar Level. (Grammes *per Centum*.)
1.30 p.m.	0·255
1.40 p.m.	0·253
1.55 p.m.	0·257
2.05 p.m.	0·255
100 milligrammes of alloxan injected intravenously.	
2.15 p.m.	0·262
2.40 p.m.	0·251
3.05 p.m.	0·247
3.25 p.m.	0·245
3.40 p.m.	0·241
4.00 p.m.	0·245
4.15 p.m.	0·249

Summary.

1. A simple method involving the intravenous injection of alloxan is described for the production of experimental diabetes in rabbits.

2. Alloxan *per se* has no action on the blood glucose level. In all probability its hypoglycæmic action is due to the liberation of insulin.

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PERIARTICULAR FIBROSITIS OF THE KNEE AND THE VALUE OF LOCAL ANALGESIA.

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PAIN in the region of the knee joint, when not due to mechanical derangements or to any well-defined disease (such as tuberculosis or rheumatoid arthritis), will frequently be found associated with fibrositic lesions of adjacent muscles. Painful knees are a more prolific cause of disability in the army than in civil life, because of the added strain imposed on the lower limb by military training; the pain of muscular lesions is accentuated by fatigue.

Kellgren (1938, 1939), whose work is now well established, has demonstrated that pain due to muscular lesions in the limbs usually radiates to the region of a joint. The painful joint may or may not be tender to pressure; in fact, Kellgren stated that pain referred to a joint is accompanied by tenderness less commonly than when referred to other areas. This observation is readily confirmed by ordinary clinical experience; everyone can recall "arthralgias" of obscure origin in which no objective tenderness could be discovered. I myself, when suffering from generalized fibrositis a few years ago, was mystified by the pain in my knees, which was accompanied by no swelling or demonstrable tenderness. There was little limitation of movement; but the pain was worse on weight-bearing, and aching occurred at night. It was necessary to change the position of the joints at frequent intervals to ease the stiffness, and cramps of a peculiarly unpleasant quality occurred if the position of semi-flexion was held for some time, as when sitting in a motor-car.

Periarticular Fibrositis.

Periarticular fibrositis is described by Ray (1934) as painful thickening of the periarticular structures. Slocumb (1940) states that it is characterized by arthralgia, stiffness and articular thickening. It can be differentiated from arthritis because of the absence of redness, widespread tenderness and muscular atrophy, and there is little evidence of fluid in the joint. Slocumb divides the course of the pathological changes into three stages: (i) low-grade inflammation, (ii) local thickening, (iii) fibrous contractures or capsular thickening. The process may be interrupted at any of these stages. At first the pain and tenderness may be elusive; but if the disease progresses, the pain becomes more constant, persistent aching is felt, and tenderness becomes manifest. The symptoms are variable in intensity, and fatigue and nervous exhaustion are prominent. As a rule, according to Slocumb, the affection clears up sooner or later, leaving no deformity.

In practice, I have found that the fibrositic knee behaves like fibrositis elsewhere. There is a well-defined area of tenderness in muscle, and referred tenderness may be found over a greater or lesser area of the joint surface. The pain may or may not be accompanied by swelling; the range of movement usually is limited, though the degree varies. The pain may be worse on weight-bearing, or the patient may complain bitterly of aching at night. The lesion may follow an injury, or it may be one of several

rheumatic lesions; in many cases the single lesion appears spontaneously.

The pain is felt more commonly on the inner side of the joint, and tenderness will be detected more frequently on the medial side. The region of the joint line may be tender, and when this happens in a case which follows an injury, a lesion of the semilunar cartilage may be simulated. Cutaneous hyperæsthesia is found in a minority of cases.

Local Analgesia.

If a local anæsthetic agent is injected into the tenderest spots in the capsule, the pain often will be found to be abolished and mobility to be restored. The relief is not lasting, however, and the injection is followed by aggravation of the condition. Adjacent muscles should be searched for tender spots, and when these are discovered, local anæsthesia will have the surprising effect of causing the tenderness of the capsule to disappear. The relief in a large number of cases is permanent.

Muscular lesions may be found in any situation in relation to the joint; but in the great majority of instances I have found them on the inner side posteriorly. It is exceptional to find on the outer side a muscular lesion which can be treated successfully; now and then one will be found anteriorly, in the lower fibres of the quadriceps. A number have been found in the inner fibres of the calf muscles behind the tibial condyle; but by far the commonest site is in relation to the inner condyle of the femur, at what I term the "adductor tubercle spot" (Figure I). Points of exquisite tenderness may be found along the upper border of the condyle, or a lesion may be found a little further back, in the fibres of the semimembranosus muscle. On deep infiltration of the lesions, the tenderness of the whole internal aspect of the knee will be found to disappear, together with other symptoms, such as pain on weight-bearing and limitation of flexion. Occasionally an apparent lesion will be found in the outer part of the soleus, or deeply in the popliteal space at the joint line; but one should be chary of infiltrating these regions, for a severe reaction with aggravation of the joint condition may ensue.

In many cases articular or periarticular swelling accompanied the other signs; if the treatment was successful in allaying the pain, the swelling subsided in the course of a few days.

Reports of Cases.

In a previous paper (Kelly, 1941) I have made reference to cases appropriate to this essay. More recently a larger number of patients have been under observation, with results that confirmed my earlier optimism in many respects and corrected it in others.

CASE I.—Lance-Corporal N. had suffered for one year from generalized periarticular fibrositis. Most of the joints had been affected, but at this stage he complained most of painful stiffness of the left knee and shoulder. Generalized muscular wasting and some periarticular swelling of several joints were present, but there was little tendency towards deformity. The left knee was slightly swollen, with perhaps a little fluid. Flexion and extension were limited, and the knee and adjacent tissues were tender to pressure over a wide area on the inner side. The tenderest spot was at the upper border of the internal femoral condyle. When this was infiltrated, the widespread tenderness vanished and the mobility of the joint was much increased, complete extension being possible and flexion falling short of the maximum by only a few degrees. After a few hours, however, the joint was more painful than ever. Though the pain and stiffness could be abolished at any time by infiltration of the soft tissue lesion, no permanent improvement occurred, and treatment by this method was abandoned.

CASE II.—Private H.C.C. was admitted to hospital on January 17, 1942, after an injury to his right knee. The joint was distended with fluid, and the X-ray examination revealed no abnormality. A straight plaster splint was applied and weight-bearing exercises were prescribed. On removal of the plaster on January 29 the synovitis had subsided, but the thigh muscles had wasted. With appropriate treatment the tone of the quadriceps improved and the mobility of the joint was restored. On February 16, however, the patient began to complain of pain in the knee, and on February 23 the pain was constantly felt. He felt as if the muscles behind the joint had "knotted". On examination, no swelling was present, and the quadriceps had returned to normal. The joint was tender on the inner side over the tibial and femoral condyles. A circumscribed tender area at the top of the internal femoral condyle was injected with a local anæsthetic agent (Figure I). The pain disappeared for twenty-four hours, but recurred. On February 27 the spot was injected again. This time the pain did not recur, and the patient returned to duty on March 4.

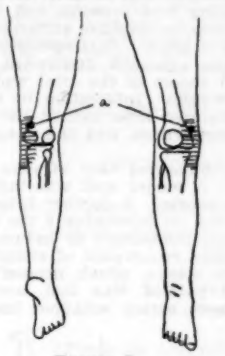

FIGURE I.

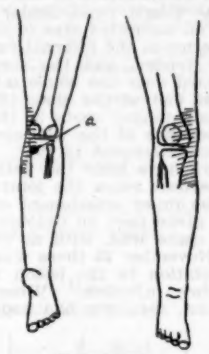

FIGURE II.

Figure I.—Case II: *a* = site of lesion ("adductor tubercle spot"); shading = area of secondary tenderness.

Figure II.—Case IV: *a* = site of lesion (in soleus muscle); shading = area of secondary tenderness.

CASE III.—Private P. ricked his knee early in January, 1942, when on a troopship *en route* for Singapore. He was sent back from the Sunda Straits, and came under my care on January 30. The knee joint was distended with fluid and the quadriceps was wasted. He was treated in a straight plaster splint with weight-bearing, and on removal of the plaster three weeks later the synovitis had subsided. The tone of the quadriceps gradually improved, but the knee became painful at the end of February. In spite of intensive physical therapy no progress was made. On March 28 he still complained of pain on weight-bearing, and he had only 70° of flexion at the joint.

Infiltration of a tender "adductor tubercle spot" immediately increased his range of flexion to 110° and he could bear weight without pain. He had no more pain in the knee, and when he was transferred to a convalescent depot on April 22 he had almost complete flexion.

CASE IV.—Driver T.J.R. was first examined on March 23, 1942. He had been under treatment for four weeks for pain in the right knee, which had been twisted in a struggle with a member of the military police. The skiagram revealed no abnormality. He could not bear weight or firmly extend the knee because of pain on the inner side, and he could lift the straight leg only a few inches off the bed. There was some limitation of flexion; no abnormal mobility was found. There was no swelling, but diffuse tenderness was found over the inner side of the joint, and the greatest tenderness seemed to be localized to a spot in the inner attachment of the soleus muscle (Figure II). When this region was infiltrated the widespread tenderness disappeared, and the patient stood up and walked without a limp. For a few days he complained of slight pain in the joint, and the spot was injected again on March 28. He returned to duty on April 1, free from disability.

CASE V.—Warrant-Officer L.M. was admitted to hospital on January 8, 1942, with the history that a sudden pain had occurred in the left knee, which had "let him down". The joint remained painful, and his condition was diagnosed as early osteoarthritis, though the X-ray film revealed no abnormality. On January 23 no improvement had occurred. The quadriceps was wasted, and he could not bear weight on the extended knee. Both flexion and extension were limited, and some crepitus was felt in the joint. He complained of pain mainly behind the knee and in the upper calf muscles. Cramps would wake him at night. He pointed out a tender spot in the inner head of the gastrocnemius. When a local anæsthetic agent was injected into this, the pain and limitation of mobility vanished. The pain did not recur. On his return to his clerical duties on February 3 he felt only a slight ache after heavy exercise. The quadriceps remained wasted, and the leg was noticeably weaker than its fellow.

Case VI.—Mrs. J.R. was examined on October 23, 1940. Her left knee had been painful for eight months, and she had several times visited the out-patient clinic at a hospital. At first the knee was swollen, chiefly on the inner side. The swelling later subsided; but the joint remained painful, with much limitation of movement and aching at night. A painful swelling of her left foot, which commenced at the same time, had subsided after a few months.

On examination of the knee only 70° of flexion was possible. Slight periarticular swelling was present, and there was an indurated area of subcutaneous swelling situated just posterior to the internal femoral condyle. This swelling was very tender, and the tenderness extended downward and forward over the whole internal aspect of the joint and the upper end of the tibia (Figure III). Infiltration of three acutely tender spots in the indurated area caused the disappearance of the widespread tenderness, and the range of flexion increased to 105°.

Two days later the patient complained only of pain and tenderness below the joint line. A tender spot was injected in the inner attachment of the soleus. A further injection was given here on October 29, and on November 6 the knee was quite well, with no swelling, tenderness or induration. On November 25 there was a slight recurrence of symptoms in relation to the lesion in the soleus, which necessitated another injection. When the patient was last seen in August, 1941, she had had no more bother with her knee.

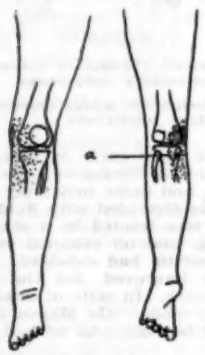

Figure III.

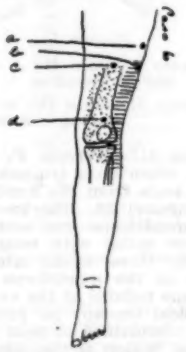

Figure IV.

Figure III.—Case VI: shading = area of panniculitis; stippling = area of secondary tenderness; *a* = site of lesion in soleus.

Figure IV.—Case IX: *a* = site of blow; *b*, *c* and *d* = lesions in muscle; shaded and stippled areas = areas of secondary tenderness. The tenderness in the shaded area disappeared upon anæsthetization of lesion *b*; the stippled area behaved similarly when lesion *c* was injected. Full flexion became possible when lesion *d* was injected.

Case VII.—Mrs. E.B.W., aged twenty-four years, complained on December 14, 1940, of a painful left knee of ten days' duration. At first both knees ached; then the left knee swelled. It "let her down" frequently, and ached badly at night. Rest was prescribed. On December 20 the synovitis had subsided, but the knee continued to ache at night. She could not straighten it, and it "gave" when she was walking. The pain seemed to be in the centre of the knee.

On examination of the knee, both flexion and extension were found to be limited. Injection of the "adductor tubercle spot" was followed by the restoration of full extension and flexion. She still complained of pain in the centre of the joint; this disappeared on infiltration of a tender spot in the inner head of the gastrocnemius, near the joint line.

No further pain was felt for five weeks; then the previous disability recurred in full. On examination on January 24, 1941, the patient's condition was the same as on December 20, 1940. On this occasion injection of the "adductor tubercle spot" gave complete relief, and when I saw her in July, 1942, she had had no more trouble.

Case VIII.—Private J.L.P. was examined on August 24, 1942; he complained that his right knee was stiff and painful. He had had almost continuous trouble since a slight accident at football a year before. It was worse after marching, and had now arrived at the stage when he could walk only with difficulty.

On examination, no swelling was present; he walked with the knee stiff, and had only 30° of flexion. The knee was tender to pressure on the front and both sides, and the tenderness extended eight inches above and six inches below the joint. The muscles seemed excessively tender over a much larger area. Cutaneous hyperalgesia was demonstrable over most of this area. The tenderest spot was in the region of the adductor tubercle. Three days later no improvement had occurred with orthodox treatment, and local anæsthesia was tried. After unsuccessful injection of the "adducor tubercle spots", an excessively tender deep spot was found three inches above the usual site. Injection caused a stab of severe pain, but was followed immediately by the abatement of all pain, tenderness and cutaneous hyperalgesia, and the patient could flex his knee to 90°. Four days later he was sent back to his unit with no disability whatsoever.

Case IX.—Gunner F.G.B. was kicked on the outer side of his left thigh near its centre on May 3, 1942. Until May 6 he noticed only stiffness; then pain commenced, which spread from the site of the blow down to the knee and up to the hip. On his admission to hospital on May 8, he complained of continuous pain in the knee, and the joint was fixed in extension. The knee joint was tender to pressure on its anterior and outer aspects, and the tenderness extended up the thigh to the junction of its middle and lower thirds. A localized area of tenderness was found on the outer side of the thigh three inches below the site of the original blow. Infiltration of this abolished the tenderness on the outer side of the knee and the thigh; but the anterior aspect remained tender. A lesion was found at the upper end of this tender area; when it was injected, the remaining tenderness was abolished, except an acutely tender spot two inches above the superior pole of the patella. This was anæsthetized, and the disability of the knee completely vanished (Figure IV). The thigh felt stiff for two days, but the patient returned to duty on May 12, free from disability.

Résumé of Cases.

Of 46 cases suitable for investigation in this manner, the disability was completely relieved in 26.[1] In the majority of the remainder the disability was abolished, wholly or in great part, for the duration of the analgesia. In the army most of the cases followed injury (for example, Cases II, III and IV). Several of these cases were under suspicion as lesions of the internal cartilage, and they bring to mind the recent warning of McMurray (1942), that in army surgery in England the diagnosis of such lesions often is not confirmed at operation. Cases VIII and IX presented pictures almost identical with text-book descriptions of hysterical joints; they illustrate the lesson that unexplained rigidity of a joint and cutaneous hyperæsthesia are not necessarily pathognomonic of hysteria.

The indurated area in Case VI is an example of panniculitis, or fibrositis of the subcutaneous tissues. Numerous writers on fibrositis (Traeger, 1937; Telling, 1939; Ray *et cetera*) agree that the inner aspect of the knee is a common site for panniculitis.

Early osteoarthritis was seen in several cases, more particularly in patients aged over forty years. When present, it did not preclude relief by injection, though perhaps it rendered it less likely. The pain was felt in both knees in six cases, and in three treatment was successful. In two cases which followed injury, the pain spread to the opposite knee after some weeks or months. (I have noted previously this tendency for fibrositic pain, whether rheumatic or post-traumatic, to spread symmetrically.)

When periarticular swelling occurred, it subsided within a few days of the relief of the pain. In the case of synovial distension, treatment by rest was required in addition.

The relief given by local anæsthesia cannot be classified with the "usual 70% of improvement" of which Tegner (1939) speaks as the common result of the introduction of any new treatment for chronic rheumatism; for no cure or relief has been claimed unless unmistakable improvement, both subjective and objective, followed immediately upon the injection. Oil-soluble anæsthetic agents have not been used. It seems reasonable to expect that they would give improved results in the resistant cases.

[1] In a series of chronic cases seen recently at a convalescent depot it was unusual to secure lasting relief. Chronicity appears to play a large part in determining the prognosis.

Previous Researches.

Kellgren (1939) exhaustively investigated the treatment of painful knees with local analgesia; but he devoted his attention to the fibrous capsule rather than to the adjacent muscles. While he was successful in relieving the disability, he did not state that the relief was permanent. In the growing literature upon the value of local anæsthesia, painful knees have been somewhat neglected. Dally (1940) stated that tender spots should be sought in the muscles just proximal to the joint. Good (1941, 1942) described a myalgic lesion in the lower fibres of the semimembranosus muscle. Mennell (1934) observed some years ago that a sensitive deposit in the upper part of the calf might be the sole cause of a painful knee. That such a lesion may be responsible for reflex synovial distension is suggested by the following case.

CASE X.—Lance-Sergeant W. sustained in a motor-cycle accident a lacerated wound of the upper part of his calf, with involvement of muscles and destruction of skin. Healing was slow, and a contracture of the muscles caused the loss of 30° of extension. On his attempting to extend the knee, pain was felt in the calf and in the front of the knee. There was no lesion of the joint or its ligaments, but the damaged muscles at the upper and inner part of the calf remained extremely tender to palpation. After bearing weight for a short time the joint would become distended with fluid, though periarticular swelling was not observed; when the limb was rested for two days the synovitis would subside. When the contracture eventually was overcome, five months after the injury, the joint ceased to swell.[1]

Reflex Hyperæmia and Synovitis.

In previous papers I have suggested that the swelling which often accompanies fibrositis may be brought about by reflex vascular effects accompanying the pain and the reflex tenderness, which result from a muscular lesion. In the nuchal region, and in other places where the tissues are dense, this is manifested as induration. Where the subcutaneous tissue is lax (for example, at many joints), an œdema that pits may be seen. Where the œdema occurs in tissues surrounding a bursa, the walls of the latter may become lined with fibrin or distended with fluid. If the hyperæmia involved the synovial membrane and capsule of a joint, it should not be surprising if the joint became distended with fluid.

In certain instances, therefore, the manifestations of synovitis and periarthritis can be regarded as the reflex effects of a muscular lesion.

Summary.

1. Pain in the knee, when not due to mechanical derangements or to any well-defined disease, is frequently caused by fibrositic lesions in adjacent muscles. As with fibrositis elsewhere, the lesion may be traumatic, rheumatic or idiopathic in origin.

2. There may be few objective signs, or movement may be limited and the joint tender, with or without periarticular swelling. Occasionally synovial distension is seen.

3. The injection of a local anæsthetic agent into the primary lesion abolishes the pain, tenderness and loss of mobility; frequently the relief is permanent. It is suggested therefore that the manifestations of arthritis in some cases are brought about by a nervous reflex.

Acknowledgement.

My thanks are due to the Director-General of Medical Services for permission to publish this paper.

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[1] Two years after the injury this patient now has signs of osteoarthritis in both knees.

HOOKWORM INFESTATION.

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As the presence of hookworm infestation in soldiers who have served in the islands north of Australia has recently been the subject of a leading article in THE MEDICAL JOURNAL OF AUSTRALIA,[1] it is of general interest to record the following observations on the clinical picture and the results of treatment in a series of 386 cases examined at this hospital during the past months. The period of observation covers a period of approximately six months after the men left endemic areas. In most instances the probable period of exposure was not more than four or five months.

Ova obtained from an unselected series of 29 patients were forwarded for investigation to the School of Public Health and Tropical Medicine, Sydney, and three types of hookworm were found to be present in these men. In six instances double infestations were found (Table I).

TABLE I.
Types of Hookworm Identified in 29 Cases.

Type.	Number of Cases.
Ankylostoma duodenale	12
Ankylostoma braziliense	2
Necator americanus	21
Mixed *Necator americanus* and *Ankylostoma duodenale* ..	6

Since the diagnosis of hookworm infestation depends upon the discovery of ova in the fæces, an incubation period, during which a clinical diagnosis of infestation cannot be made, must elapse between the time of penetration of the host's skin by larvæ and the development of a mature female worm. This period is usually stated to be about five weeks; but in one case in which the patient was under close observation, ova were not found in the fæces until the fourteenth week after the soldier had left the endemic area.

As in addition to establishing a diagnosis of infestation it is desirable to ascertain the degree of infestation present, Stoll counts of the ova in the fæces were made in a series of 67 consecutive cases (Table II). In most cases there were probably five or less female worms present, in a smaller proportion five to ten were present, and in an occasional case greater numbers of female worms were present.

The observations recorded in this paper, therefore, refer to patients during the first six months of a mild infestation with hookworm. During most of this period they have not been exposed to reinfection. In almost every instance the clinical picture has been complicated by recurring malarial infection.

TABLE II.

Number of Ova Present in 0·1 Gramme of Faces. (Stoll Count.)

Number of Ova.	Number of Cases.
1– 5	45
6–10	16
11–15	2
16–20	1
29	1
49	1
107	1

These patients were all having light diets and forming small amounts of faces. It was therefore considered that one ovum per 0·1 gramme of faces indicated two Necator or one Ankylostome female worms.

Clinical Picture.

The clinical signs and symptoms produced by hookworm infestation are due, either to the larvæ penetrating the skin and producing a local reaction, or to the adult worms in the alimentary canal giving rise to dyspepsia and a considerable disturbance of the leucocyte picture.

The local reaction produced by the passage of larvæ through the skin is said to be different with different types of larvæ. Larvæ of *Necator americanus* produce the typical "ground itch", consisting of an intense local irritation followed by local erythema and an eruption of small vesicles. *Ankylostoma braziliense* larvæ give rise to a "creeping eruption" in their passage through the skin; but those of *Ankylostoma duodenale* often give rise to no local reaction. In the present series, it was difficult to obtain adequate information concerning the incidence of such skin lesions, owing to the almost universal occurrence of fungous and other skin lesions. A few men did give a history of typical "ground itch", but no lesions suggestive of a "creeping eruption" had been noted.

One-third of the patients infested complained of vague dyspeptic symptoms, which had arisen in the islands, and whilst in some instances these spontaneously disappeared on the patient's return to the mainland, in others the dyspepsia persisted until effective anthelminthic therapy had been carried out. This dyspepsia was of the flatulent type, with a feeling of distension rather than epigastric pain, and was associated with an intermittent anorexia which recurred every few days. Many of the patients spontaneously admitted that their general well-being was greatly improved by treatment, although previously they had been unwilling to admit to any ill health. Although these symptoms were recorded in cases of hookworm infestation, they also occurred in patients who could not be proved to have helminthic infestations. As the adult worms suck blood from the intestinal mucosa, laboratory tests have often shown occult blood to be present in the faces.

Hæmoglobin estimations and leucocyte counts were carried out on 200 consecutive patients on the third day after completion of the seventeen-day treatment for malaria. In order to determine the disturbance in the blood picture produced by the malarial infection, similar observations were made on 100 consecutive patients with malaria, who had served in the same areas as the hookworm patients, but who had not contracted helminth infestation. The results (Tables III and IV, Figures I and II) obtained from these two series have been compared to determine the changes due to hookworm infestation.

TABLE III.

Leucocyte and Hæmoglobin Values of 100 Convalescent Malaria Patients. (No Helminth Infestation Present.)[1]

Observation.	Finding.
Total white cells per cubic millimetre [4,000–11,000].	4,000–17,000 cells per cubic millimetre (83% between 7,000 and 14,000).
Lymphocytes per cubic millimetre [1,000–4,500].	1,500–5,500 cells per cubic millimetre (81% between 2,500 and 5,000).
Neutrophile cells per cubic millimetre [1,500–7,500].	2,000–12,000 cells per cubic millimetre (78% between 3,000 and 7,000).
Monocytes per cubic millimetre [0–800].	0–1,000 cells per cubic millimetre (78% below 400).
Eosinophile cells per cubic millimetre [0–400].	0–1,350 cells per cubic millimetre (85% below 400).
Hæmoglobin percentages [100% = 14·5 grammes per 100 cubic centimetres of blood].	55%–100% (73% between 81% and 95%).

[1] Normal values are shown in brackets.

TABLE IV.

Leucocyte and Hæmoglobin Values of 200 Convalescent Malaria Patients with Hookworm Infestation.

Observation.	Finding.
Total white cells.	5,000–30,000 cells per cubic millimetre (87% between 7,000 and 14,000).
Lymphocytes.	1,000–10,000 cells per cubic millimetre (85% between 2,000 and 5,000).
Neutrophile cells.	2,000–11,000 cells per cubic millimetre (82% between 3,000 and 7,000).
Monocytes.	0–1,750 cells per cubic millimetre (85% below 400).
Eosinophile cells.	0–12,500 cells per cubic millimetre (70% between 500 and 2,500).
Hæmoglobin percentages (100 cases only).	60% to 100% (79% between 81% and 95%).

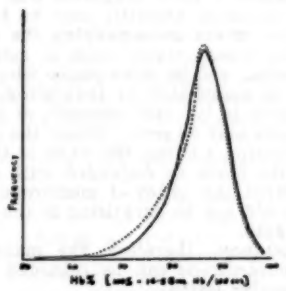

FIGURE I.

Graph showing distribution of hæmoglobin values derived from (a) 100 patients convalescent from malaria, no helminths present (continuous line), and (b) 100 patients convalescent from malaria, hookworm infestation present (interrupted line).

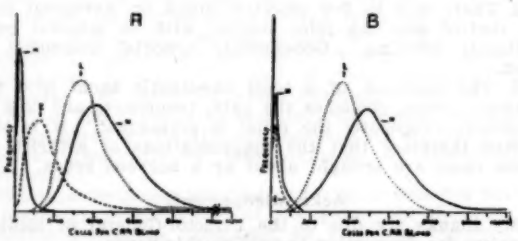

FIGURE II.

Graphs derived from comparable series of patients, showing distribution of leucocytes. The first series (A) consisted of 200 consecutive patients convalescent from malaria in whom hookworm infestation was present. The second series (B) consisted of 100 consecutive patients convalescent from malaria and without helminths. E = eosinophile cells, L = lymphocytes, M = monocytes, N = neutrophile cells.

Although chronic hookworm infestation produces a considerable fall in the hæmoglobin content of the erythrocytes, no evidence has been obtained in this series to indicate that the mild infestation present has done so in the period observed. Figure I gives a comparison of the

hæmoglobin values for the two series of patients, and shows that the hæmoglobin deficiency present (average 85%—12·3 grammes of hæmoglobin per 100 cubic centimetres) is associated with the malaria infection and not with the hookworm infestation.

Compared with the accepted values for normal healthy people, the leucocyte counts indicate the presence of an absolute lymphocytosis in the malarial cases.

Comparison of the leucocyte counts in two series shows that the only disturbance in the blood picture produced by hookworm infestation is the production of a pronounced absolute eosinophilia. The maximum number of eosinophile cells recorded was 12,500 per cubic millimetre and the maximum percentage of eosinophile cells was 80%, the averages being respectively 1,800 cells per cubic millimetre and 14%.

An analysis of the curves in Figure II shows that the eosinophile cells vary independently of any other type of cell. To express the eosinophile count as a percentage of the total number of leucocytes may therefore be misleading, and only the absolute counts are of any value from a diagnostic standpoint.

Although pronounced eosinophilia was present in the hookworm patients at the time of examination, serial observations consistently showed that the numbers of eosinophile cells fell rapidly twenty-four to thirty-six hours before a malarial rigor and did not regain their maximum values until some fourteen days after the rigor.

Diagnosis.

The presence of hookworms was established in all cases by the finding of ova in the fæces, which were examined by the Willis concentration technique. This procedure was made a routine investigation for all patients who had served in the islands. Only one specimen of fæces from each patient was examined as a routine measure, and probably a number of infestations was therefore missed. However, many of them were indicated by the presence of eosinophilia in thick blood films examined at the completion of malarial therapy. It is to be noted that eosinophilia is usually absent from thick films made for diagnostic purposes at the time of a malarial rigor.

Differential Diagnosis.

Hookworm infestation of the mild type encountered in these malarial patients produces two diagnostic problems: firstly, it is a cause of vague dyspepsia, and secondly, it gives rise to eosinophilia.

Although the dyspepsia is vague, clinical investigation may reveal the presence of occult blood in the fæces, and peptic ulceration may therefore be suspected. It is important that, if hookworm infestation is the basis of dyspepsia, it should be recognized, for it is readily amenable to treatment.

The main diagnostic problem, however, is the interpretation of eosinophilia when it is discovered in these patients. A count of 400 cells per cubic millimetre is usually considered to be the upper limit of normal; but this is an incorrect assumption for these patients with recurring malaria, for Figure II indicates that 11% of such patients have eosinophile counts ranging between 500 and 1,350 cells per cubic millimetre. In addition to hookworm, *Ascaris lumbricoides*, *Trichocephalus trichiuris* and *Strongyloides stercoralis* have been found to give rise to eosinophilia. Ascaris and Strongyloides infestations are usually associated with eosinophile values above the upper limit of the malarial readings (1,350 cells per cubic millimetre). Trichiuris and hookworm infestations, however, in a proportion of cases, produce very low eosinophile counts. From a study of the eosinophile cell curves presented, it may be stated that, if the number of eosinophile cells is below 500 per cubic millimetre, hookworm infestation may be present, but is unlikely. If the number is between 500 and 1,350 cells per cubic millimetre, then there is almost an equal chance that the malaria patient is infested or is not infested. If the number is above 1,350 cells, it is almost certain that a helminth infestation is present.

Of all the cases associated with eosinophile cell counts above 500 cells per cubic millimetre, there were 144 in which ova and larvæ were absent from the fæces at two initial examinations. In 39 instances, evidence of some form of helminth infestation was discovered on repeated examination of the stools. In 19 cases the eosinophilia disappeared after the exhibition of anthelminthic drugs, and was therefore presumed to be due to an undiscovered helminth infestation, possibly by male worms only. In 61 of the cases the number of eosinophile cells was within the possible limits for malarial patients, and as no ova or larvæ were found in the fæces on repeated examination, and no reduction in the eosinophilia occurred after the exhibition of anthelminthic drugs, these readings are thought to be accounted for by the malarial infection present. This number of cases is well within the expected figure, as from the 1,418 malaria patients examined some 156 would be expected to have eosinophile cell values between 500 and 1,350 cells per cubic millimetre. The remaining 25 patients had a completely "unexplained" eosinophilia (2,000 or more cells per cubic millimetre), for no protozoal infestation or other cause such as filaria was found. Four of these patients were examined by complement deviation tests for *Schistosoma japonicum* infestation, but in all cases negative results were obtained.

TABLE V.
"Unexplained" Eosinophilia in Malarial Patients.

Origin of Eosinophilia.	Number of Cases.
Probably normal	61
Due to helminthiasis:	
Proved	39
Presumed	10
Unexplained	25

These 25 patients all suffered from recurring malaria. Possibly the findings in these cases represent the upper limits of eosinophilia in that condition, which were not evident in the control series because of the relatively small sample examined. On the other hand, their eosinophilia may be due to some undiscovered agent.

Treatment.

A variety of recognized anthelminthic drugs has been used in the treatment of these patients. As, however, in many cases several different drugs were used, a comparison of their effectiveness is possible only by the recording of those cases in which one dose produced an apparent cure. Table VI records these findings and also indicates the doses used in each case. With all the drugs a preliminary period of forty-eight hours' light or semi-fluid diet was given, associated with a saline purge the night before treatment. When the drugs were given in capsules they were followed by a further saline purge; but if they were dispensed as an emulsion, one ounce of magnesium sulphate was incorporated in the emulsion.

TABLE VI.

First Drug Used.	Number of Cases.	Number of "One Dose" Cures.
Hexyl resorcinol (15 grains)	23	4
Oleum Chenopodii (2 cubic centimetres) ..	18	2
Carbon tetrachloride (3 cubic centimetres)	15	4
Carbon tetrachloride (3 cubic centimetres) and *Oleum Chenopodii* (1 cubic centimetre)	169	125
Tetrachlorethylene (4 cubic centimetres)	85	42
Tetrachlorethylene (4 cubic centimetres) and *Oleum Chenopodii* (1 cubic centimetre)	76	52
Total	386	229

The Stoll counts recorded show that the degree of infestation in these cases is fairly uniform, and therefore

this comparison gives an approximate idea of the relative value of the different drugs. In 157 cases more than one course of treatment was necessary, and then the vermifuge was usually changed. It is apparent that the most effective drug used alone is tetrachlorethylene. The emulsions containing *Oleum Chenopodii* and either carbon tetrachloride or tetrachlorethylene seem equally the most effective vermifuges. Over the whole series, in 60% of the cases the stools were freed from ova on the fifth and seventh days after treatment with one dose of anthelminthic, and in 80% of cases the stools were freed from ova with repeated doses. Of the remaining 66 patients, eight were transferred to other medical units before completion of treatment. In 35 cases elimination of worms was not achieved with repeated doses of anthelminthic, and the remaining 23 patients are still under treatment.

The figures are summarized as follows:

Number of patients treated	386
Number of patients with fæces free from ova at the end of the period of observation ..	320
Number of patients whose treatment was incomplete when they were transferred from this hospital	8
Number of cases in which treatment failed to remove ova from fæces	35
Number of patients still under treatment	23

With the cooperation of a convalescent depot, it has been possible to reexamine, at the end of the third week after treatment, 68 of the patients whose fæces had been freed from ova when they were discharged from hospital. In 51 of these cases the eosinophile counts had returned to normal values or had fallen considerably. In half of the remainder ova were present in scanty numbers.

In an endeavour to reduce the time spent in hospital by these patients, a few were given anthelminthic treatment (tetrachlorethylene and chenopodium) during the "Atebrin" stage of malarial therapy. No deleterious results were observed from this procedure, and if eradication of worms is achieved, this reduces the hospital period by about seven days.

Toxic Effects of the Drugs Used.

The only toxic effects that have occurred in this series have followed the use of carbon tetrachloride and tetrachlorethylene. In all, 317 doses of anthelminthic containing carbon tetrachloride were given; in two cases a mild degree of jaundice lasting for three days was noted, and in another two cases the patients complained of right-sided upper abdominal pain, with tenderness over the liver, but without jaundice.

Tetrachlorethylene consistently produces a mild disturbance of the central nervous system indicated by pronounced muscle incoordination, similar to that of "intoxication". This develops about two hours after administration of the drug and lasts for some three hours.

The occurrence of these toxic symptoms indicates that the doses of the drugs used have been the maximum that can be given with safety.

Criteria of Cure.

The observations made on patients examined three weeks after treatment indicate that eradication of the worms in this type of case cannot be held to have been achieved unless stool examinations have extended over at least three weeks. Moreover, the absence of ova does not exclude the survival of male worms. It would seem likely, however, that all worms (male or female) have been removed if the number of eosinophile cells has returned to normal or has fallen considerably.

The absence of ova from the fæces on three examinations at intervals of one week and a normal or rapidly falling number of eosinophile cells should, therefore, be the criteria of cure of these patients. If, however, the absence of ova from the stools on the fifth and seventh days after treatment is accepted as the criterion of cure, a maximum error of only about 10% is to be expected, and in these cases it is probable that the degree of infestation will have been substantially reduced.

When a large population of people mildly infested with hookworm, and with minimal clinical symptoms, is to be treated, reduction of the reservoir of worms is the object to be aimed at. From this viewpoint only the female worm is important. In the circumstances, examination of stools for ova on the fifth and seventh days after treatment seems to be a satisfactory standard to adopt, and considerably reduces the length of stay in hospital.

Summary.

1. A series of 386 cases of recent mild hookworm infestation occurring among patients suffering from malaria has been studied.

2. The range of the numbers of eosinophile cells in the blood of convalescent malarial patients has been determined, and it has been found that eosinophilia occurs in an appreciable number of such cases.

3. Clinically the infestation has produced skin lesions, dyspepsia and pronounced eosinophilia, but no anæmia greater than that common to these malarial patients.

4. A considerable fall in the number of eosinophile cells has been observed to precede a malarial rigor.

5. A comparison has been made between the therapeutic efficiencies of various anthelminthic drugs, and indicates that emulsions containing *Oleum Chenopodii* with either carbon tetrachloride or tetrachlorethylene are the most effective.

6. The criteria of cure are stated.

Acknowledgement.

We wish to acknowledge with thanks the permission of the Director-General of Medical Services to publish the paper.

Reference.

(1) The Medical Journal of Australia, Volume I, 1943, page 515.

FURTHER OBSERVATIONS ON DIRECT BLOOD TRANSFUSION.

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Direct blood transfusion by the rotary pump method has been performed in Melbourne in over one thousand cases during the past four years. Descriptions of apparatus and technique have appeared in the literature,(1) so that a detailed description in this paper is deemed unnecessary.

Apparatus.

The pump used by us is the Julian Smith improved double roller rotary type, the principle being the serial compression of a rubber tube.

One length of standard stethoscope compression tubing (8·0 millimetres bore) and two lengths of thin-walled collapsible rubber tubing joined by short glass connexions are used, making a total tubing distance for blood flow from donor to recipient of thirty-six inches.

The Julian Smith needle of stainless steel has been used throughout. This is thin walled, and has a highly burnished internal surface. A needle of 1·33 millimetres bore has been most often used both for transfusion and for venesection, and with these needles transfusions occupying up to sixteen minutes have been carried out without any difficulty.

We have performed over 100 transfusions by this method, without failure to transfuse the amount of blood aimed at on any occasion. Patients suffering from a variety of conditions—in particular, hæmorrhaging peptic ulcer, uterine hæmorrhage, traumatic and post-operative hæmorrhage and blood dyscrasias—have been given transfusions, but no case of cardio-respiratory disease is included.

A Study of the Rate and Volume of Administration of Blood.

Divergent opinions are held regarding the volume of blood to be injected and the rate of injection. Those who advise slow rates and small volumes stress the danger of circulatory overloading. All agree that in cases of cardio-respiratory disease this danger is a very real one; but authorities differ widely in their opinions regarding the rate and volume of transfusions for patients not affected by such disorders.

Few observations have been made on the rapid transfusion of relatively large volumes of blood to human beings, and we have aimed to investigate this problem.

Methods.

The blood was transfused directly from donor to recipient by the rotary pump, previous calibration of which allows the volume transfused at any moment to be read. The time factor was recorded by a stop-watch reading to the nearest second. Hæmoglobin estimations were made before transfusion and at frequent intervals after transfusion. The general condition of the patient throughout and after the transfusion was observed, blood pressure and pulse rate being recorded at frequent intervals, and in a small number of cases venous pressures were estimated by the continuous manometric method advocated by Paul Wood.[3]

Scrupulous cross-typing was carried out, and only donors of the same blood group as the recipient were used, as it is now realized that dangers exist in the indiscriminate use of the so-called "universal donor". In the case of group O donors with an extremely high titre of agglutinins, hæmolysis of the recipient cells may occur, owing to insufficient dilution of these iso-antibodies.[2] In "Rh-negative" patients receiving multiple transfusions, iso-immunization may occur from the use of "Rh-positive" donors. Recognizing this, we adopted Landsteiner and Wiener's technique[4] and were able in such cases to demonstrate intra-group incompatibility. In one case, for instance, 15 donors were so tested, and 12 proved unsuitable. This ratio agrees approximately with the percentage naturally occurring in the community.

In the majority of cases one pint of blood was given at each separate transfusion; but in a number of cases of gross exsanguination following acute blood loss, two donors were used to give a continuous transfusion of two pints, and in one case a total of three pints was given from three successive donors.

CASE I.—Mrs. M.L., aged twenty-eight years, who belonged to blood group O (IV), had suffered from menorrhagia for five years, and from massive uterine hæmorrhage for three days before transfusion. The accompanying graph gives the salient features of her first transfusion (Figure I). The hæmoglobin level was raised from 37% (14 gramme standard) to 45% as a result of this transfusion. Two days later a further transfusion of one pint was given in three minutes forty seconds, the hæmoglobin level being raised a further 10%. The patient's blood pressure prior to transfusion was 120 millimetres of mercury, systolic, and 70, diastolic, and the pulse rate was 100 per minute; none of these varied significantly during or after the transfusion.

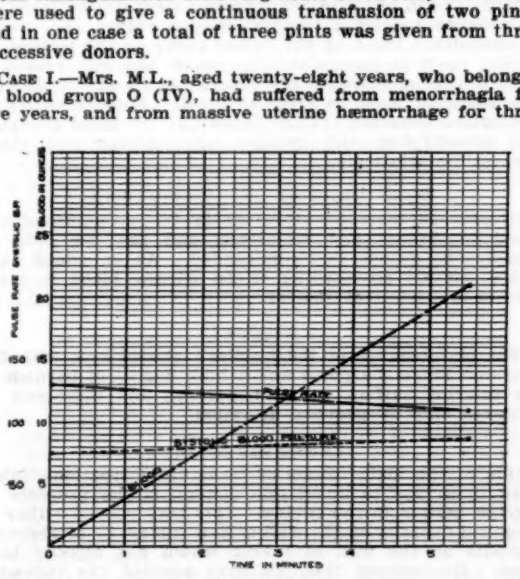

FIGURE I.

These results are typical of all the cases in which one pint of blood has been given at one transfusion.

Rate.

The average rate of transfusion in 100 cases has been one pint in five minutes twelve seconds. The maximum rate was one pint of blood in three minutes eight seconds, and the minimum one pint in seven minutes ten seconds. In the majority of cases the rate deviated but little from the mean. In any one transfusion, although the time for the delivery of one pint of blood was approximately five minutes, the actual rate during the transfusion varied, it being slowest after approximately five ounces had been delivered; this factor was dependent on the donor, who usually developed a "'pale arm" at this stage.

Hæmoglobin Value.

The average hæmoglobin value prior to transfusion in this series was 35% (14 gramme standard), and we confirmed the findings of other workers that one pint of blood given to an average adult raises the hæmoglobin value approximately by 10%.

Venous Pressure.

As has been pointed out by Paul Wood,[3] continuous measurements of venous pressure are a satisfactory guide to the condition of the right side of the heart. Such measurements were taken during the giving of one pint of blood by transfusion in a small number of cases by means of the continuous manometric method devised by Wood. The maximum increase in venous pressure was four centimetres of water, and the figure returned to normal shortly after the completion of the transfusion.

Massive Transfusions.

It has already been stated that the average hæmoglobin value prior to transfusion was 35% (14 gramme standard), and this applies to the majority of patients suffering from acute blood loss. It is obvious that most of these patients would require more than one pint, and that many would require several pints of blood; hence the need for the transfusion of larger volumes.

At first, in the case in which relatives were acting as donors, with their consent we withdrew larger volumes of blood up to 27 ounces. As in the cases of single pint transfusions, we found no evidence of circulatory overloading or of any discomfort whatsoever to the patient from the rapid injection of this larger volume of blood. We then decided to transfuse still larger volumes of blood, using two donors, and in one case this idea was carried still further by the use of three donors.

Technique of Massive Transfusion.

The general arrangement was as for a single transfusion, the transfusion being given in the wards in all cases. Two suitable donors were selected, their blood pressures were taken and the vein to be used was decided upon. The donors' arms were surgically prepared and covered with sterile towels. One donor was placed in position for transfusion, and the second was allowed to lie on another bed, suitably placed to receive the first donor after his blood had been taken. After the completion of the first half of the transfusion the donor needle was withdrawn, the tubing was replaced in the saline reservoir, and a small amount of saline solution was transfused to clear the tubing and prevent reflux. A needle for the second donor was attached, care being taken that no air was allowed to enter the system. At the same time the donors were interchanged, and the second stage of the transfusion was commenced. By this means the blood flow was interrupted for approximately two minutes.

In fourteen transfusions of this type, the average time taken was twelve minutes eight seconds, and the average volume of blood delivered was two pints. The maximum volume delivered at any one transfusion was two pints six ounces.

No difficulty due to coagulation was encountered at any stage, and it is pointed out that no anticoagulant is used in this method.

CASE II.—L.R., aged fifty-two years, who belonged to blood group A (II), was admitted to hospital with the diagnosis of hæmatemesis. On November 17, 1942, this patient had had a hæmoglobin value of 35%. He was given a direct blood transfusion of one and three-quarter pints, his hæmoglobin value being raised to 52%. Two days later a second massive transfusion of forty-two ounces was given, with a resulting hæmoglobin value of 79%. The details of the second transfusion are shown in Figure II. This transfusion occupied thirteen and a half minutes.

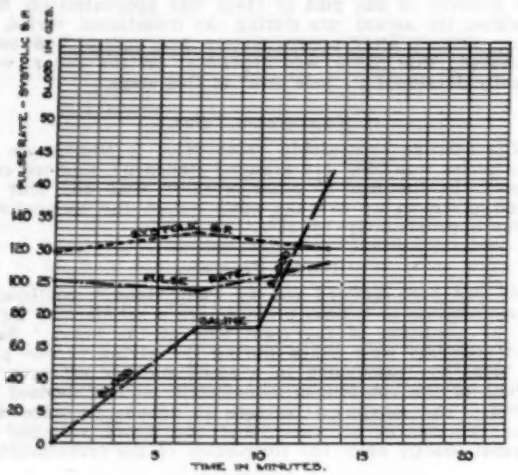

FIGURE II.

This is a typical example of massive blood transfusion. The patient received approximately four pints of blood in two transfusions at an interval of two days, his hæmoglobin value being raised by 44%. He experienced absolutely no discomfort and was in excellent clinical condition. The following day the patient was subjected to laparotomy, which unfortunately revealed an inoperable gastric carcinoma.

CASE III.—Mrs. D.W., aged forty-five years, who belonged to blood group O (IV), was admitted to hospital with a severely mangled arm, which became grossly infected; a profuse secondary hæmorrhage resulted. Urgent operation was considered imperative and a "drip transfusion" was attempted. Owing to peripheral circulatory failure consequent on her poor general condition and extensive blood loss, this was unsuccessful; accordingly a direct transfusion of two pints was given, two donors being used. Owing to previously sustained burns, the use of veins in the cubital fossa of the other arm was impracticable, and a small vein in the dorsum of the hand was used. By this means, with minimal disturbance to the patient, it was possible to administer the blood in eleven and a half minutes; an immediate improvement in her general condition permitted the necessary amputation. Convalescence was uneventful.

The direct transfusion of two pints of blood from two donors appeared to us after careful consideration to be a perfectly safe procedure in selected cases, and we determined when a suitable case presented itself to utilize three donors to give a direct transfusion of three pints of blood. The description of such a case is given below.

CASE IV.—P.D., a male patient, aged sixty-four years, belonged to blood group A (II). He had a gastric ulcer associated with hæmatemesis and melena. Figure III gives the salient features of this transfusion.

In this case three pints of blood were given in twenty-one and a half minutes with a resulting rise in hæmoglobin value of 25%; this was accompanied by a rise in systolic blood pressure from 100 millimetres of mercury to 140 millimetres, and this pressure fell soon after the transfusion to a constant value of 120 millimetres of mercury. There was a small initial fall of pulse rate, followed by a gradual rise to an intermediate value.

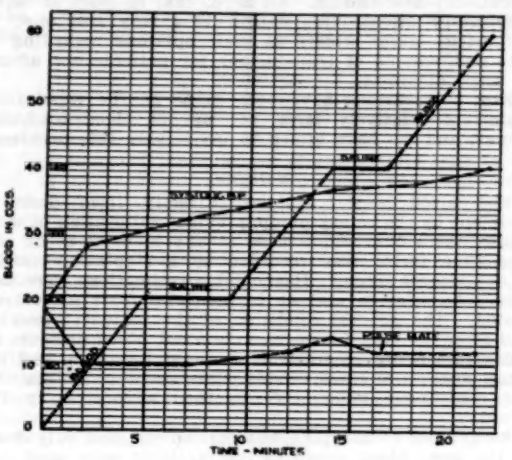

FIGURE III.

Discussion.

Ideally, a practical method of blood transfusion involves the transference of the required quantity of blood at a desired rate from donor to recipient, with as little physical, physiological or chemical change as possible, combined with a simplicity of technique. We believe that the rotary pump method closely approaches the ideal as far as physiological requirements are concerned, and should not be condemned because of so-called "difficulty" of technique, for the method is basically simple. After a small amount of instruction, no more than is required to familiarize oneself with the giving of a transfusion of citrated blood, we have given over 100 transfusions by this method.

For patients not exhibiting cardiac or pulmonary disorders—and in our experience these constitute the majority of patients requiring transfusion—we regard the giving of unmodified blood by the rotary pump as the method of choice, as it is physiologically sound and has proved a certain, safe and simple procedure. As in any technique, due attention must be given to detail. Factors requiring meticulous attention are the following: (i) blood grouping and cross-typing, (ii) needles, (iii) tubing and glass, (iv) saline solution.

Blood Grouping and Cross-Typing.

Great care must be exercised in the grouping of the blood of donors and recipients, and the use only of homologous groups is recommended. As an added safeguard, mutual cross-typing of the donors' blood is desirable in multiple transfusions.

Needles.

The maintenance of the needles[3] should rest with the operator, since sharpness and a high degree of burnish of the internal surface are all-important, and these can be achieved only by personal attention.

Tubing and Glass.

One of the main causes of transfusion reactions, other than those due to unsuitable donors, is the presence of foreign matter in the tubing. This may consist either of chemical deposits on the wall of new tubing, or of fibrinous deposits on the wall of tubing which has already been used. Recognizing this, we have adopted the following procedure. New tubing was thoroughly brushed through with warm, soapy water, boiled in 5% sodium hydroxide solution, and then flushed through in turn with dilute hydrochloric acid, fresh running water and at least three

times with glass-distilled water. At the completion of a transfusion, tubing was immediately washed out with a strong jet of cold water and subsequently brushed with hot, soapy water. After this it was washed in running water, boiled, and flushed at least three times with glass-distilled water.

Saline Solution.

Foreign material or bacteria in saline solution may be a cause of mild transfusion reactions. It is therefore essential that the supply of normal physiological saline solution used be above suspicion.

Dosage and Rate.

The commonest criticism by interested observers of direct blood transfusion is the danger of circulatory overloading and embarrassment to the right side of the heart, termed by Hyman and Hirshfeld "speed shock".[6] In our series of over 100 cases we were unable to observe this so-called syndrome, even though the blood was administered at an average rate of 1·9 cubic centimetres per second.

The only post-transfusion reactions conforming to the syndrome of "speed shock" observed by Rathwell and Crocker[7] in a careful study of the velocity factor in a series of unmodified blood transfusions, were found on investigation to be due to incompatibility.

Kilduffe and De Bakey,[8] in over 5,000 transfusions of unmodified blood, have safely administered 500 cubic centimetres of blood at a rate of one cubic centimetre per second, and in urgent cases have frequently given 600 cubic centimetres of blood at a rate of two cubic centimetres per second without any untoward reaction.

Trueta[9] makes the following statement:

> In 2,000 transfusions for hæmorrhage the Barcelona Service gave an average of more than two pints per patient in an average period of ten minutes. . . . Most of the patients received the first pint at a quicker rate than the rest, but no case of cardiac failure was reported from dilatation of the right heart.

Wood (1940),[2] in an investigation of the problem of failure of the right side of the heart, considered that measurements of venous pressure gave a reliable indication of the condition of the right side of the heart.

We found, in our measurements of venous pressure during a transfusion of one pint of blood at a rate of two cubic centimetres per second, that the average rise of venous pressure was 30 millimetres of water, and that there were only slight variations in blood pressure and pulse rate before and after the transfusion. All patients showed evidence of peripheral vasodilatation. These venous pressure findings are in accordance with the work of Sharpey-Schafer *et alii*,[10] and of Loutit, Mollison and Van der Walt.[11] The former workers found evidence of dilatation of the peripheral and pulmonary capillaries and veins, which accommodate the increase in blood volume, thus relieving the stress on the right side of the heart, as evidenced by the small rise in venous pressure.

Correlating our findings with those of the foregoing workers, we infer that there is no rational basis for the objection to the rapid transfusion of relatively large volumes of unmodified blood in cases uncomplicated by myocardial damage or by pulmonary disease.

Therapeutics.

After an extensive survey of methods of blood transfusion, Beck[12] has come to the following conclusions:

> From this unbiased review of the literature, of the statistics, of the avoidable and unavoidable causes of reactions, it would seem reasonable to assume that blood the shortest time outside the body; to which no foreign substance is added; which does not have an opportunity to become chilled nor to be exposed to the air; and which comes in contact with a minimum of foreign substances, all other things being equal, will give the most consistent and satisfactory results in all types of cases.

We do not suggest that transfusions of unmodified blood should in all cases replace drip transfusions of citrated blood; but we believe that this method is particularly indicated in cases of acute anæmia due to hæmorrhaging peptic ulcer, uterine hæmorrhage, trauma and pre-operative and post-operative hæmorrhage, and in any cases in which recurrent hæmorrhage is likely.

In these cases the rapid restoration of blood volume is all-important, and several pints of blood are usually necessary to bring this about.

Marriott and Kekwick[13] have advocated transfusions of citrated blood by the "continuous drip" method; but this involves a slow replacement of blood volume.

We have found transfusions of two pints of unmodified blood, followed if necessary after a short interval by a second massive transfusion, to be a quick and reliable method of restoring the blood volume. No tendency to further hæmorrhage due to the rapidity of transfusion has been observed. Furthermore, in certain blood dyscrasias, hæmorrhagic states and chronic infective conditions, unmodified blood, containing as it does fresh red blood corpuscles, leucocytes, clotting elements and immune bodies, is in fact a complete tissue graft.

In many cases of hæmorrhaging peptic ulcer, we have noticed the tendency to cessation of bleeding after the transfusion of smaller quantities of whole blood than has been required in comparable cases in which transfusions of citrated blood have been given. In these cases, in which nervous strain is so important, the added advantage of a rapid procedure was impressed upon us by the minimal reaction of the patient to this method of giving blood as compared with the prolonged nervous stress during a time-consuming drip transfusion.

Summary and Conclusions.

1. The safety and simplicity of direct blood transfusion by the rotary pump method have been demonstrated.

2. A description of massive transfusion of unmodified blood, and a report of three cases, are given.

3. A study of dosage and rate of transfusion has been made, and it is concluded that the so-called "speed shock" syndrome in cases unassociated with cardio-respiratory disease is a myth.

4. The possible therapeutic advantages of whole blood are discussed, with special reference to hæmorrhaging peptic ulcers.

Acknowledgements.

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Reviews.

A MANUAL OF PSYCHIATRY.

TREDGOLD'S "Mental Deficiency" has been a standard work for over thirty years. The same author has now given us a companion but shorter book on psychological medicine.[1] This "Manual of Psychological Medicine" is a straightforward, concise and well-balanced work planned on conventional lines and free from the literary extravagances which detract from some books on the subject. The student who uses this book will gain a solid foundation of the salient facts concerning all the more important mental syndromes and the principles of their treatment. There is a brief psychological introduction and the chapter on aetiology errs perhaps on the side of undue condensation. The author has certainly kept to his aim of producing a work which is "short, plain and practical". We note in the chapter on obsessions that the late Field-Marshal Lord Roberts continues to be the outstanding example of those who "are mad when they behold a cat". Benzedrine and nicotinic acid are not included in the treatment of alcoholic states, nor is the latter mentioned in connexion with pellagra. There is a useful chapter on mental instability in which the emotional excesses not amounting to psychosis or even to any clearly defined psychoneurosis, in infancy, adolescence and the climacteric are brought to the reader's notice in a practical manner. We are pleased to see adequate recognition given to exhaustion states, occurring in individuals without any pronounced psychopathic disposition, and following definite stress. Dr. Tredgold refers to those states as secondary neurasthenia. There has been too great a tendency to elicit a cumbrous foundation of complexes and repressions for such quite simple mental reactions. Somatic symptoms in the psychoneuroses also receive the attention which they deserve—general practitioners should take note.

In the chapter on traumatic neuroses the author refers to the urge to make gain out of an injury and states: "If this process is a subconscious one, it is hysteria; if it is conscious and deliberate, it is malingering." The often difficult differential diagnosis is dealt with at length later in the book. Due emphasis is laid on the number of factors not under medical control which may operate in compensation cases. On page 121 the statement, "but usually the most suitable sedatives are 2 or 3 drams of paraldehyde, chloral, veronal, nembutal, trional and soneryl", might mislead the inexperienced.

With regard to delinquency, Dr. Tredgold is less impressed with the results of probation than with treatment in Borstal institutions. In the chapter on mental deficiency we note the inclusion of schizophrenic amentia, a condition which tends to be overlooked. The importance of social as against educational incapacity in the diagnosis and disposal of adult defectives is another point which is not always appreciated fully.

The sections on legal relationship and certifiability are adequate and the work concludes with a chaper on sociological considerations which might be amplified with benefit. Psychological aspects of industrial medicine and the role of social workers and lay organizations in regard to social misfits are assuming greater importance.

This work may be ranked with the best of recent books on psychiatry.

PROGRESS IN RADIOLOGY.

THE "1943 Year Book of Radiology" has been received from the publishers.[2] The authors again are Charles A. Waters, Whitmer B. Firor and Ira I. Kaplan. The work is well up to the standard of previous editions. It is divided into diagnostic and therapeutic sections. The volume is a review of the modern literature and of articles appearing in the various radiological journals. The author's name is given in the case of each digest with references to the journals in which the articles appeared. Many of the rarer conditions of bone, for example, Gaucher's disease, osteopoikilosis, hyperparathyreoidism *et cetera*, are dealt with. An interesting article on aseptic bone necrosis by Lewis describes this unusual late result of bone injury, for example, after fracture of the neck of the femur when the bone becomes less dense and irregular areas of new bone may be formed. Lewis considers this to be due to interference with nutrition. Recovery is the rule. The external methods of fixation of fractures by screws and clamps is dealt with *in extenso*. In regard to injuries to intervertebral disks, the difficulty in diagnosis is stressed. The author of this article is far from enthusiastic on the use of myelography in its diagnosis.

An interesting method of stereoscopic localization of foreign bodies in the eye is described. It is not convincing and certainly not as easy a procedure as the modified Sweet's method.

Many interesting films of various chest conditions are set out. It is suggested that the Ghon primary focus when calcified is quite innocuous. In the section on gastro-intestinal examination a method of conducting a one-day gall-bladder and opaque meal examination is described and should be of value where time is a consideration. Many interesting gastro-intestinal lesions are described and well illustrated. Various cases of death following excretion pyelography are reported. Some of these were due to anaphylaxis, but some occurred after many days and were considered to be due to injury to the viscera by the drug. There is apparently no way of anticipating these bad results, although skin tests reveal allergic states.

In the section on technique the five by four inch method is rather favoured, and if properly conducted only 2% of retakes on seventeen by fourteen inch films are necessary. The 35 millimetre method is placed on a par with fluoroscopy for mass examinations.

A good method for examination of the sternum is described with a table showing the amount of tube tilt required for subjects with varying thicknesses of chest.

The section on therapeutics follows conventional lines. Several improved methods of application of X rays are described. Many of these articles reviewed are rather unconvincing and have been published on too small a series of cases. The work is an excellent book of reference. It is all interesting reading and shows the enormous amount of original work that is being undertaken in the wide field of radiology.

Notes on Books, Current Journals and New Appliances.

"MATILDA" AND THE "TOMMIES".

AN entertaining account of her adventures during a term of service as a temporary major in the Royal Army Medical Corps is given by Dr. Mary Kent Hughes in her book, "Matilda Waltzes with the Tommies".[1] Having tried unsuccessfully to enter the Australian Army Medical Corps in the days before women doctors were admitted, the author travelled to England and was without difficulty accepted in the Royal Army Medical Corps. From then on she had the doubtful joy of being a lone woman medical officer in the various hospitals with which she served, and we are given to understand that the outraged feelings of her first commanding officer aroused by the situation, although not expressed in so many words, were fairly obvious. The author saw service in England during the "blitz", and afterwards in various parts of the East, including the Holy Land, and she also spent a short vacation in Eire. Her book is full of amusing anecdotes, of snatches of history, of shrewd observations about the people in the various lands which she visited, and of satisfying descriptions of natural surroundings. She has a ready wit and an easy literary style, and her book will be read with pleasure and interest.

[1] "Manual of Psychological Medicine: For Practitioners and Students", by A. F. Tredgold, M.D., F.R.C.P., F.R.S.E.; 1943. London: Baillière, Tindall and Cox. 8½" × 5½", pp. 307. Price: 18s.

[2] "The 1943 Year Book of Radiology"; Section on Diagnosis edited by Charles A. Waters, M.D. and Whitmer B. Firor, M.D.; Section on Therapeutics edited by Ira I. Kaplan, B.Sc., M.D.; 1943. Chicago: The Year Book Publishers, Incorporated. 9" × 6", pp. 456, with many illustrations. Price: $6.00.

[1] "Matilda Waltzes with the Tommies", by Mary Kent Hughes (T/Major Thornton, R.A.M.C.); 1943. Melbourne: Oxford University Press. 8½" × 5½", pp. 176, with many illustrations. Price: 7s. 6d.

The Medical Journal of Australia

SATURDAY, APRIL 1, 1944.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

THE SIXTEENTH SESSION OF THE NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL.

THE sixteenth session of the National Health and Medical Research Council was held at Canberra on December 1 to 3, 1943, and a report of the proceedings has been published. The document is full of references to matters that are of great importance to the medical profession of Australia at the present time, and attention should therefore be directed to some of them. When it is remembered that the Council was created, *inter alia*, "to advise Commonwealth and State Governments on all matters of public health legislation and administration, on matters concerning the health of the public and on medical research", its pronouncements cannot be neglected. Many people are ready and willing to offer, and are actually offering, advice to the Government on the matters stated. Of the Government itself, we have it on the authority of Senator the Honourable J. M. Fraser, Minister for Health, that "governments are not always able to accept the advice which is offered, but in the matter of health the Government is very anxious to do whatever is right and is in the best interests of the people of this community". The Minister used these words in his opening address to the Council at its recent meeting. According to this statement all that remains to be determined is what is right and what is in the best interests of the people of the Commonwealth.

In his opening address to the meeting, the chairman, Dr. J. H. L. Cumpston, referred to his letter to this journal published in the issue of June 12, 1943, dealing with the functions of the National Health and Medical Research Council and to the reply of the General Secretary of the Federal Council of the British Medical Association in Australia, Dr. J. G. Hunter, published in the issue of August 7, 1943. He also mentioned some remarks by Dr. F. W. Carter at a meeting of the Federal Council regarding the "spirit and intention" underlying the formation of the National Health and Medical Research Council. He then said quite bluntly that "the spirit and intention underlying its formation were not what the British Medical Association thought they should be, but what the governments concerned in its formation intended". He supported this statement by quoting from speeches by the Right Honourable W. M. Hughes, Minister for Health at the time, and by himself at the first meeting of the National Health and Medical Research Council. (A long report of this meeting was published in this journal in the issue of March 6, 1937.) The medical profession in Australia must recognize that, for better or for worse, the National Health and Medical Research Council is in being and is exercising the dual function indicated by its name. No one will deny that since its inauguration in 1937 the Council has fathered important researches in more than one branch of medicine. This will be admitted even by those who hold, as the Federal Council does, that research should be divorced entirely from departmental control; such an admission, they believe, will not invalidate their arguments. We recall that Professor F. Wood Jones in 1937, in recommending that everyone should wait and see and should not rush to the conclusion that the Council would be useless from the research point of view, told how in his youth he had been taught not to judge a cigar by the picture of the lady on the box. In the present report there is published a list of applications for research grants that were approved after they had been received by the full Council from the reference subcommittee and considered. The total amount set down as having been voted for the year is in the neighbourhood of £20,000. Some of the larger grants were for purposes obviously connected with the conduct of the war. One thing that cannot be gathered from the report is whether any of the recommendations of the reference subcommittee were not adopted by the Council. There are those who all along have hoped that the research side of the National Health and Medical Research Council would eventually evolve along independent lines nearer to their heart's desire. Among these is Sir Henry Newland, who expressed this view at a meeting of the Federal Council in 1936, adding that half a loaf was better than no bread. While therefore we may hope and even expect in the fullness of time to receive the full loaf, working the while to obtain it, we should enjoy and make the best possible use of the half loaf that we have.

Among all the subjects discussed at the meeting, pride of place must be given to nutrition. The Council had before it a report of the activities of the Nutrition Committee for the year 1943. This is a document whose importance to the people of the Commonwealth cannot be exaggerated. The difficulties of the food situation have been mentioned on more than one occasion in these columns, and we note with great satisfaction that the National Health and Medical Research Council "views with great concern" the position which will arise this year "in respect of the supply of vital foods, especially in relation to the needs of women and children". The Council has had the courage to draw attention to the inequitable distribution of food between the civil population on the one hand and the members of various services engaged on duties civil in nature on the other. There is also a "disturbing factor" introduced into the rationing

schemes by service personnel who are provided with full service ration, but who also draw materially on food available for public sale. Factors such as this will be hard to remedy, and the same statement will hold in regard to other considerations mentioned in the Nutrition Committee's report. It is pointed out here that the rationing of meat will help to equalize the distribution between households, but that there is no guarantee of an equitable distribution within the house. "Experience gained in nutrition surveys strongly suggests that if the total quantity of meat entering a house is not sufficient to supply the psychological demands of the adult male members of that household, then the adult females and the children will forgo their ration." Such an arrangement will not be new to many households, but the number of households in which it does occur will be sure to increase. The Nutrition Committee wisely points out that the physiological result of this procedure will depend on the amount of dairy products entering the house and their distribution among members. It holds that with the introduction of meat rationing eggs become an integral part of the food supply of the whole community. Eggs are essential in the diets of infants, children, pregnant women and invalids. When the Nutrition Committee forwarded recommendations on meat rationing to the interdepartmental committee it laid stress on these facts. It also insisted that it was imperative for a full investigation of the possibilities of, and if possible the introduction of, a scheme that would ensure the regular distribution of eggs to the vulnerable groups of persons. The committee believes that under a priority scheme children of six months to five years of age should have three eggs a week and pregnant and lactating women should have six a week. The committee also holds decided views about milk. There is, it states, definite evidence that the amount of milk normally consumed by the civilian population is at the lower limit of safety, and that any reduction would lead to a deterioration of health. It therefore recommends that the amount of milk available for civilian consumption should not be reduced below the pre-war consumption level. To this it adds that a scheme for the controlled distribution of milk should be introduced. The committee also makes recommendations regarding vegetables and butter and the distribution of certain foods to the inland areas. That a reduction in available supplies of important foods is inevitable figures prominently in the newspapers, and apparently this is no exaggeration. The National Health and Medical Research Council evidently takes a serious view of the statements made by its Nutrition Committee. It also refers in its resolution on the subject to the state of affairs in Queensland—a subject mentioned at the last meeting of the Federal Council. The Council urges the introduction of a scheme that will ensure the controlled distribution of vital foodstuffs to vulnerable groups of the population. It also considers that there is immediate need for the establishment in each State health department of a nutrition section. There is nothing in the report to show whether any consideration was given to the establishment of a Ministry of Food for the whole Commonwealth. This appears to be the only way in which proper control of food supply will be brought about. To be effective, such a ministry would need to control both military and civilian food supplies, and, most important of all, be in the hands of a first-class administrator.

The other subjects discussed by the Council can be little more than mentioned in the hope that opportunity for fuller reference to them may come later on. Venereal diseases were discussed and action regarding them was urged. Tuberculosis was the subject of a resolution, and emphasis was again laid on the need for a special rate of pension for breadwinners suffering from clinical tuberculosis. A report on housing and health was received and a committee was appointed to continue investigations into the medical aspect of the subject. The care of children was considered in the light of a report by Dr. Vera Scantlebury; her recommendations were adopted. A resolution was adopted dealing with X-ray technique, apparatus and so on, and a standing committee was recommended for appointment under the chairmanship of Dr. C. E. Eddy to report on the matter from time to time.

Finally, mention must be made of the attitude of the Council to the sixth interim report of the Parliamentary Joint Committee on Social Security, published in full in this journal in the issue of July 17, 1943. In his opening address to the Council the Minister, Senator Fraser, asked the Council to examine the report carefully and to submit such advice as seemed appropriate. The memorandum to the Minister is published as an addendum to the report; this memorandum was also used by Dr. J. H. L. Cumpston to express the views of the Council when he attended as its sole delegate the conference of December 8, 1943, between the Parliamentary Joint Committee and representatives of the medical profession. (See THE MEDICAL JOURNAL OF AUSTRALIA, March 11, 1944, page 220.) While criticism of this memorandum will for the time being be withheld, attention must be drawn to the statement appearing towards the end of the document, that: "The Council has always advised that, before any decision is reached, full discussion should take place between the Commonwealth Government and the medical profession. Without the active and willing co-operation of the profession no system can succeed." That the Commonwealth Government does not heed this advice is clear from the fact that it is introducing a Pharmaceutical Benefits Bill without having obtained the cooperation of the profession. The National Health and Medical Research Council also suggests that "greater benefit would result from an informal conference of medical men representing the Council and the British Medical Association than from a conference in its present form" (the conference of December 8, 1943). It thinks, however, that before such a conference would be profitable, some major questions of policy would have to be determined. In spite of all that has happened lately in the medico-political field, it is much to be hoped that none of the bodies interested in the future of medical practice will pass by any opportunity for discussion in the future.

Current Comment.

THE FIRE DISASTER AT BOSTON: NEURO-PSYCHIATRIC COMPLICATIONS.

A GENERAL account was given in THE MEDICAL JOURNAL OF AUSTRALIA of March 20, 1943, of the Cocoanut Grove disaster at Boston when fire broke out and more than

490 persons of more than one thousand who were present lost their lives. In our issue of October 30, 1943, attention was drawn to a symposium on the management of burns caused by the fire which was published in *Annals of Surgery* of June, 1943. Now Alexandra Adler, writing from the neurological unit of the Boston City Hospital and the Department of Neurology and Surgery of the Harvard Medical School, gives an account of the neuro-psychiatric complications that occurred among the victims.[1]

The total number of patients admitted to the Boston City Hospital was 131. Of these, 36 died within the first two weeks. Forty-one patients left hospital within the first three weeks; of these, 20 reported in answer to a *questionnaire* and from 21 no report was received. At the end of the third week the remaining 54 patients had been subjected to a neuro-psychiatric examination. Of these 54 patients, three died later on and five left Massachusetts and could not be reached for reexamination. The report deals mainly therefore with 46 patients who were seen in the acute stage and were followed up later. Of the 46 patients, 20 manifested no psychiatric complications at any subsequent period; 25 presented symptoms of general nervousness and anxiety neurosis which lasted at least three months. One patient has a lasting brain lesion with symptoms of visual agnosia; it is thought that the condition is the result of exposure to carbon monoxide fumes. Nine months after the disaster 32 of the 46 patients showed no alteration from their "pretraumatic personality"; 13 still suffered from general nervousness and anxiety neurosis. Patients with general nervousness complained chiefly of general irritability, fatigue and insomnia. In these cases the change in working capacity was not pronounced, unless work was contraindicated by the poor physical condition. Patients with symptoms of anxiety neurosis had fears and anxiety which they were unable to control and which prevented a readjustment to normal activity. The prognosis in these cases was not good; nine of fourteen patients so affected manifested hardly any improvement after the interval of nine months. In some cases (the history of one patient is given in full) the condition was aggravated by feelings of guilt for not having saved a companion.

Some interesting observations are made in regard to unconsciousness at the time of the fire. Twenty-nine of the patients became unconscious during the fire and 17 did not lose consciousness. Of the 29 patients, 13 lost consciousness for less than one hour and 16 were unconscious for periods varying from one to several hours or days. Of the 20 patients who did not develop psychiatric complications, 15 had lost consciousness, and in 12 of the 15 cases the period of unconsciousness lasted for more than an hour. Of the 25 patients who manifested psychiatric complications, 13 had lost consciousness, but in ten of these cases the period of unconsciousness was short, being less than an hour. This suggests to Adler that unconsciousness and in particular prolonged unconsciousness was an essential factor in preventing the development of further psychiatric difficulties. She then adds that the mechanism at work is perhaps comparable to the beneficial effect of shock treatment in mental disease. "Here too attacks of petit mal with short periods of unconsciousness are undesirable, whereas grand mal seizures with prolonged unconsciousness may bring about the setting for recovery from mental disease." The cautious critic may be forgiven if he questions the wisdom of the general deduction and the justification for the comparison. In regard to the suggestion that unconsciousness was an essential factor in prevention of further difficulties, it must be noted that 41 of the 46 patients observed the outbreak of flames; in other words they experienced a profound shock. Most patients reported having lost consciousness immediately after feeling choked. Adler remarks that "this terrifying event is remembered by the same percentage of patients who had lost consciousness as by those who remained conscious". The effect of "this terrifying event" on the individual would vary with his or her temperament. Adler gives the history of a woman, aged twenty-two years, a factory worker, who, when she had recovered from her burns, stated that it did not bother her in the least to think of the night of the fire and that she was looking forward to going to another night club. It is true that this woman did not remember much about the fire itself. The view that a prolonged period of unconsciousness would mitigate the subsequent mental manifestations is attractive. The figures given by Adler, however, are small and might be modified considerably if the temperament of each patient was known and a suitable adjustment could be made in view of that knowledge. The comparison of the mechanism at work with that found in shock treatment of mental disease cannot be accepted.

Adler's communication is interesting as far as it goes and practitioners everywhere will be grateful to her for it. It is not and cannot be complete, first of all because we do not know what kind of people the survivors were before the fire, and secondly because it deals only with the obvious mental picture of patients who survived. The effect on each person's subconscious mind, if any, would probably be profound and might not cause untoward manifestations until it was brought to the surface by some special set of circumstances at a later period.

[1] *The Journal of the American Medical Association*, December 25, 1943.

ECONOMY IN THE USE OF X-RAY TUBES.

THE attention of all medical practitioners who practise radiology is directed to a statement from the Chairman of the Medical Equipment Control Committee on the need for economy in the use of X-ray tubes published elsewhere in this issue. There are several ways in which economy may be effected. In the first place it should not be necessary to point out that in the present state of emergency X-ray examinations ought not to be carried out unless they are really necessary. The second point is that overloading of an X-ray tube shortens its life—a fact that is known to every user of X-ray tubes. The statement in regard to the increased number of exposures that may be made when only a percentage of the maximum load is delivered is most significant. Many radiologists are using only 50% or less of the maximum loading, but since all who use X-ray tubes may not be keeping the loading as low as possible the point should be emphasized. The Medical Equipment Control Committee is very concerned about the prospects of maintaining stocks of X-ray tubes that will permit replacement of tubes now in use. The committee is still more concerned about the prospect of continuing to give permission for the purchase of new units. Without question the chief aim at present should be to maintain present units. This means that medical practitioners and hospital authorities should think twice before they seek to purchase a new plant. Particularly is this necessary when a plant which may perhaps not be as large and as up-to-date is already installed. There is, of course, a world shortage of X-ray tubes and Australia is quite likely to have difficulty in having its full orders met.

PRESENTATION OF THE GOLD MEDAL OF THE ASSOCIATION TO COLONEL A. GRAHAM BUTLER.

WHEN the Federal Council of the British Medical Association in Australia held its meeting at Melbourne at the end of January, 1944, the Council at a special luncheon held in his honour presented to Colonel A. Graham Butler the gold medal of the Association. The medical heads of the Services and members of the Council of the Victorian Branch were present. Sir Henry Newland, who presided and made the presentation, gave those present an account of Colonel Butler's service in the war of 1914-1918 and said that the three volumes of his "Official History" would be a lasting monument to him and of enormous value to Australian medicine. Colonel Butler replied feelingly in a speech which traced his association with the "history" and was charged with happy reminiscences.

Abstracts from Medical Literature.

GYNÆCOLOGY.

Low Dosage Irradiation in the Treatment of Amenorrhœa.

Charles Nazen and Rose Greenberg (*American Journal of Obstetrics and Gynecology*, November, 1943) report on the good results obtained in the treatment of ninety-two women suffering from amenorrhœa by the use of low dosage irradiation to the pituitary and ovaries. All patients were followed up for a period of one or more years and those who were classed as failures failed to maintain normal menstruation for at least one year. It was found that the results depended on accurate dosage and technique, and close adherence to that of Edeisen, which is detailed by the authors, is recommended. The percentage of cures is inversely proportional to the severity of the amenorrhœa. Thus those who had menstruated at intervals of two to four months yielded 76% of cures; those who had menstruated at intervals of six months yielded 66% of cures; whereas those who had not menstruated at all for sixteen months to five years yielded only 50% cures. Primary amenorrhœa, as a rule, does not respond to this type of treatment, probably because of some inherent defect. When there is associated sterility with the amenorrhœa, this is often benefited by the restoration of normal menstruation. Of the sterile women in this series, 54% conceived after treatment and carried healthy infants to term. The irradiation therapy should not be administered unless the existence of pregnancy is excluded by means of a biological or some other test. Given in the correct small dosage, the irradiation of the pituitary and ovaries is not harmful to the patient or offspring.

Relief of Essential Dysmenorrhœa with Ethinyl Œstradiol.

R. A. Lyon (*The American Journal of Surgery, Gynecology and Obstetrics*, December, 1943) describes the relief of ovulatory dysmenorrhœa by the administration of œstrogens. The basis of this treatment is to inhibit ovulation by preventing the cyclic release from the pituitary of the follicle-stimulating hormone. The author confirmed the findings of other writers that adequate doses of œstrogen, given early in the menstrual cycle and continued for at least twenty-one days, relieve the cramp-like pains at the ensuing menstrual period. He gave daily doses of 0·15 milligramme of ethinyl œstradiol by mouth, commencing on the fifth cycle day and continuing for at least 24 days. Owing to the possibility of the development of hyperplasia of the endometrium, if two cycles were treated, the third was left untreated. In the treated cycles there was no dysmenorrhœa, but after the month's freedom from treatment it invariably recurred for that particular period. Cycles treated with œstrogen were often prolonged by a few days and the flow lasted longer. The untreated cycles were compensatorily shortened. In no case did ovulation fail to recur when the treatment was suspended. Occasionally no menstruation occurred at all after a course of treatment, but it reappeared equally well after a further course of œstrogen with one week's interval or after withholding the œstrogen for a month. It appears that the treatment has little to offer in the way of permanent cure and it is not recommended for this purpose. But the temporary relief may be valuable, especially in reducing the psychogenic factors so often involved. It may also be useful in differentiating essential dysmenorrhœa from recurrent abdominal pain due to other causes.

Nutritional Deficiency and Menorrhagia, Metrorrhagia, Cystic Mastitis and Premenstrual Tension.

M. S. Biskind, G. R. Biskind and L. H. Biskind (*Surgery, Gynecology and Obstetrics*, January, 1944) observed two years ago that the liver, in the presence of a deficiency of vitamin *B* complex, loses its ability to inactivate œstrogen. They now report the results of an investigation of the relationship between nutritional deficiency and clinical syndromes associated with an excess of œstrogen. Their clinical material consisted of 104 patients. Of 39 patients who were observed primarily because of the presence of lesions of nutritional deficiency, 37 had a history of one or more of the conditions related to an excess of œstrogen. Of 52 patients who complained chiefly of one of the latter disorders, and who were examined for evidences of nutritional deficiency, every one presented either signs or symptoms, or both, of deficiency of vitamin *B*. Vitamin *B* complex given either orally or parenterally, or by both routes, produced prompt and often dramatic alleviation of these gynæcological conditions. Incidental changes occurred in the skin and subcutaneous tissue, which became firmer; the complexion became clearer and brighter; the skin was no longer hypersensitive, minor contusions ceased to produce "black and blue spots" on it, and hæmorrhage no longer followed hypodermic injection. Three patients noted a diminution in the deposition of fat about the hips, thighs and abdomen, unaccompanied by loss of weight. The fat pads mentioned are specifically feminine attributes in the human being, and there is evidence that the development of the characteristic female conformity is under the influence of œstrogen. The majority of patients in the series had a low basal metabolic rate, and administration of thyreoid extract usually caused exacerbations of the signs and symptoms of the nutritional deficiency, without much change in the basal metabolic rate. Improvement followed treatment with vitamin *B* complex. Two patients who had enlarged thyreoid glands noted a diminution in the size of the glands after several months of treatment with vitamin *B* complex. The authors believe that their observations provide further evidence that menorrhagia, metrorrhagia, cystic mastitis, premenstrual tension and probably uterine myomata, are caused by failure of the liver to inactivate œstrogen in the presence of a deficiency of vitamin *B*.

Hydatid Mole and Chorionepithelioma.

E. M. Jeffreys and P. Graffagnino (*Western Journal of Surgery, Obstetrics and Gynecology*, January, 1944), in a series of 85,453 pregnancies during the last ten years, have found the incidence of typical hydatid mole to be one in 3,049. Because of the possibility of hydatid degeneration, as well as to prevent infection and continued hæmorrhage from retained products of conception, they believe that in most cases of abortion occurring before the third month of pregnancy, curettage should follow after twenty-four hours if the patient's temperature is normal, or if sepsis is present, five days after the temperature has returned to normal. Satisfactory treatment of hydatid mole demands that a thorough curettage should be carried out, either immediately or within two weeks after a mole or mole tissue has been expelled. Microscopic sections should be made and thoroughly examined. If in the mole or the products of curettage much proliferation of the trophoblast is found, or if the patient is near menopause age and has all the children she desires, total hysterectomy is indicated. If the patient is young and wants more children, her condition should be watched closely by the performance of the Friedman test every month for six months, then every three months, then twice a year for three years. If the response to the test should gradually grow more positive, or if it should change from negative to positive, and if it is certain that normal pregnancy is absent, then complete hysterectomy and bilateral salpingo-oophorectomy should be performed immediately, and radiographic studies should be made in a search for metastatic lesions from possible chorionepithelioma. If at operation a chorionepithelioma is found, operation should be followed after two weeks by deep X-ray therapy, the same plan of treatment being used as that given after operation for carcinoma of the *fundus uteri*. The frequency of occurrence of hydatid degeneration of the chorion in the presence of an abnormal fœtus, or in the absence of a fœtus, contraindicates the over-enthusiastic use of *corpus luteum* in attempts to prevent abortion.

Primary Dysmenorrhœa.

J. H. Randall and L. D. Odell (*The Journal of the American Medical Association*, November 20, 1943) state that dysmenorrhœa occurs in approximately 35% of menstruating women. Primary dysmenorrhœa is characterized by painful menstruation in the absence of demonstrable pelvic disease or endocrine deficiency. It begins with the menarche in 65% of cases and a few years later in 35%; in the latter group, the cause of the painlessness of the early menstrual cycles has been suggested to be absence of ovulation. It appears that ovulation and a nulliparous cervix are two essential factors in the production of primary dysmenorrhœa; they result in uterine distension, which stimulates contractions of sufficient amplitude to produce cramp-like pain. Earlier investigators appear to have erred in attributing the occurrence of dysmenorrhœa, directly or indirectly, to the presence of coincidental anatomical defects, such as a retroverted, anteflexed or infantile uterus, cystic ovaries, presacral neuritis, defective uterine musculature or disturbed innervation. Work has been done on the value of œstrogens in relieving dysmenorrhœa; the effect is believed to be achieved by the inhibition of ovulation, and in certain cases endometrial biopsies did in fact reveal no evidence of ovulation when

œstrogen therapy had abolished the pain. However, when the treatment was continued for several months, the pain returned in spite of this continuance. Sturgis, one of the workers in this field, suggests that the continued production of anovulatory menstruation over any length of time may result in permanent disturbance of the pituitary-ovarian relationship. The authors conclude that any method of treatment of primary dysmenorrhœa designed to inhibit ovulation has no permanent clinical value and is possibly dangerous.

Carcinoma of the Uterine Cervix.

D. G. Morton (*Western Journal of Surgery, Obstetrics and Gynecology*, January, 1944) summarizes the present position in regard to the treatment and prognosis of carcinoma of the uterine cervix. He holds that the disease should not be regarded as hopeless; the best indication of the prognosis is the clinical extent of the growth at the commencement of treatment. In individual cases the age of the patient and the immediate gross reaction of the growth affect the prognosis. The histological type of the growth is of no value in prognosis. In approximately 90% of cases the best treatment is a combination of radium and X-ray irradiation; the latter should be given first, unless the growth is small in area. X-ray therapy has materially increased the percentage of survivals, possibly by destroying cancer in the areas of primary spread, which are inaccessible to radium. The author utters a warning that X-ray irradiation is dangerous; its dosage should be reduced, or it should be omitted entirely in certain circumstances, especially in the case of elderly women. The immediate reactions are frequently so severe that the really old woman is unable to endure a full course of X-ray therapy. A small proportion of patients are satisfactorily treated by the Wertheim operation; the conditions must be specialized and the patients carefully selected.

OBSTETRICS.

Breech Presentation in Elderly Primiparæ.

D. C. Racker (*The Journal of Obstetrics and Gynæcology of the British Empire*, October, 1943) gives a review of breech deliveries in elderly *primiparæ*. He states that, although it is difficult to compare the figures of various workers because of different standards of correction, the fœtal mortality is always appallingly high. This is especially the case in *primiparæ* over thirty years of age. In his own series of cases from Saint Mary's Hospital, Manchester, he reports a fœtal mortality in these patients of 33·5% with vaginal delivery. Cæsarean section, however, on 62 patients yielded no fœtal deaths and only one maternal death (a patient with acute toxæmia). The weight of the child is important in deciding on the method of delivery. The weight with the lowest fœtal mortality appears to be between seven and a half and eight pounds. Therefore, the author concludes there is no advantage in inducing premature labour. Another important factor is the possibility of the patient's having another child, which in the elderly *primiparæ* is often unlikely. The possibility of birth injury to the child is high when the delivery is vaginal and there is added risk to the mother by the prolongation of labour and additional interference. In vaginal delivery the results depend a great deal on the skill of the obstetrician and appear to be equally bad whether delivery is performed as soon as the cervix is fully dilated or delayed until the breech appears at the perineum. The author suggests that all patients should be placed in the care of an experienced obstetrician. If version is unsuccessful, there should be a careful radiological examination to determine the size and exact position of the fœtus, whether it has any abnormality, or whether there is any deformity or inadequacy of the mother's pelvis. When all factors are given due consideration, the author maintains that Cæsarean section will be the delivery of choice for most of the *primiparæ* over thirty years of age.

Salt Restriction and Fluid Intake in Preeclamptic Water Retention.

L. C. Chesley and J. E. Annito (*American Journal of Obstetrics and Gynecology*, June, 1943) have made a rough study of restriction of salt intake and fluid intake in the prophylaxis of preeclampsia. The clinical material consisted of 237 patients having excessive extracellular water between the thirty-second and thirty-sixth weeks of pregnancy. The patients were divided into groups as follows: (i) no dietary restrictions were imposed; (ii) the diet was restricted to 1,200 Calories and two grammes of salt per day, and fluid intake did not exceed 1,000 millilitres per day; (iii) the diet and salt intake were the same as in the second group, but the fluid intake was forced. The authors state that their investigation is not complete enough to permit the drawing of dogmatic conclusions, but they present a summary of their findings. Amongst the subjects of their study, 20% of these clinically normal women who had begun to retain excessive quantities of extracellular water, later suffered from preeclampsia. Detailed analysis of the results obtained in the three groups showed that they were fairly comparable. The incidence of toxæmia was not lowered in the second group, but this is partly attributable to a concentration of unfavourable cases in this group. The incidence of toxæmia was considerably lowered in the third group; but the authors point out that, since they have made no observations on patients with the more advanced preeclamptic syndrome, they can make no pronouncement as to the advisability of forcing the fluid intake in the treatment of toxæmia. The effectiveness of prophylaxis against toxæmia increased as greater weight losses were induced by the dietary *régimes*. Paradoxically, the gain or loss in extracellular water seemed to bear no relation to the incidence of toxæmia; but the data were inconclusive on this point.

Face and Persistent Brow Presentations.

A. C. Posner and I. M. Buch (*American Journal of Surgery, Gynecology and Obstetrics*, December, 1943) give a review of 100 cases of face and brow presentations at Harlem Hospital, New York. The percentages of incidence were 0·19 for face and 0·03 for persistent brow presentations. In 58% of these a causative factor was found, the most common by far being disproportion. All causes, except coils of cord around the neck, can be diagnosed by X rays. Therefore the authors stress the necessity for careful X-ray examination and pelvimetry in these cases. In their series they found that there was a preponderance of large babies and multiparous mothers. In most of the face presentations spontaneous delivery occurred, especially when the chin was anterior or transverse. On the other hand, in only a small percentage of persistent brow presentations did spontaneous delivery take place, although many brow presentations changed to faces either before or during labour and this facilitated delivery. There was a tendency to early rupture of membranes with prolonged labour. The maternal mortality was 1·15% for face presentations and 15·4% for persistent brows, and for the babies, excluding deformities, it was 19·6% and 20%. Much better results were obtained by Cæsarean section, and this procedure is highly recommended in early diagnosed cases, especially in *primiparæ*, when any disproportion exists. If there is no disproportion it is advised to avoid interference in a face presentation, until progress is arrested. Spontaneous delivery of a direct mentum-posterior baby, however, is impossible, as the chin becomes impacted in the sacrum. Rotation to an anterior position may be possible with the use of Kielland's forceps. Kielland's forceps are also recommended for the delivery of oblique anterior mentum and transverse mentum cases, but only when the face is well engaged. Other methods of delivery described are: (*a*) conversion to an occiput presentation, (*b*) podalic version and (*c*) low forceps operation.

Leuchæmia and Pregnancy.

J. L. Goldrick and W. A. Lapp (*American Journal of Obstetrics and Gynecology*, November, 1943) report a case of chronic myeloid leuchæmia and pregnancy and review the literature on this subject. The association is very rare. From a few cases of leuchæmia developing shortly after pregnancy some authors suppose that pregnancy may be an ætiological factor or a releasing cause. Maternal mortality is 100% and fœtal mortality 60%. The prognosis being better in the chronic types, in which the figures are 36% for the mothers and 16% for the babies. Leuchæmia seems to predispose to spontaneous induction of premature labour. The course of leuchæmia, however, for the most part appears to be very little affected by the pregnancy. Contrary to expectation, the occurrence of severe hæmorrhage during or after parturition is rare. No leuchæmic child has ever been delivered from a leuchæmic mother. It would seem that the placenta acts as a barrier to transmission of the disease. Most authors agree that there is nothing to be gained by interrupting the pregnancy. Interruption may be justified in terminal cases when there is a possibility of saving a viable child. Irradiation should not be used during pregnancy because of harmful effects on the fœtus, but arsenic may be given.

Medical Matters in Parliament.

THE PHARMACEUTICAL BENEFITS BILL, 1944.

On February 16, 1944, the Pharmaceutical Benefits Bill, 1944, was presented in the Senate by Senator the Honourable J. M. Fraser, Minister for Health and Minister for Social Services, and read the first time.

It was then resolved, on a motion by Senator R. V. Keane, that Standing and Sessional Orders should be dispensed with, so that the bill might pass through its remaining stages without delay.

Senator Fraser moved that the bill be read a second time. He said that the Government was providing for persons who were temporarily removed from economic activity by illness. It had, however, to go further and improve the system of treatment during sickness and to relieve the financial burden imposed upon people who, because of that illness, found the expense difficult to meet. The Government intended to do all that was possible to improve the quality of the services that were available and necessary for the treatment of illness and for the restoration to health. This would necessarily involve the provision of medicine, treatment in hospital and skilled medical attention. The first of these steps was embodied in the bill before the Senate.

Senator Fraser then described the general provisions of the bill, and pointed out that according to them any citizen resident in Australia could, upon presentation of a prescription by a doctor, have that prescription dispensed without cost to himself. The chemist would be paid by the Government. To meet these requirements, a pharmaceutical formulary would be introduced. In this would be included a series of prescriptions covering all reliable and essential combinations of medicines. It would be prepared by a special committee of experts and would not be limited to a stated number of prescriptions. Any prescription of value could be included if it was accepted by the formulary committee, but any prescription which was not included in the formulary would not come within the scheme. Biological preparations such as insulin and antitoxin would be included in the scheme. It had also been determined that a person could not be disqualified from receiving benefits under the scheme by reason of his sickness having been caused by his own misconduct. There would be a consultative council, which would advise the Minister on matters of policy, a formulary committee to draw up the formulary of prescriptions, and a pharmaceutical benefits committee in each State, which would investigate disputes, questions of practice and so on, and would report to the Minister. The Government recognized that the mere swallowing of medicines was not the whole of the story. The Government intended the bill only as the first of a series of measures undertaken to care for the health of the people.

Senator George McLeay said that the bill was one of the most remarkable pieces of legislation that had been brought before the Senate. Practically everything of importance in connexion with it would have to be done by regulation. Bureaucratic control was becoming one of the greatest menaces that the people of Australia had to face. The bill would not do very much to improve the health of the people, and was merely another instalment of the dole—something for nothing. He was quite satisfied that this legislation was the thin end of the wedge of socialization. Senator McLeay's second objection to the measure was that the Minister who had been negotiating with the members of the medical profession in Australia had not been able to convince the profession that the scheme was sound. Senator McLeay then read the statement made by Sir Henry Newland on behalf of the medical profession at the informal conference held at Canberra on December 8, 1943 (see The Medical Journal of Australia, December 18, 1943). Senator McLeay said that the Federal Council of the British Medical Association had endorsed Sir Henry Newland's statement and had sent another letter to the Minister. This was a letter sent by the General Secretary of the Federal Council to the Minister after the last meeting of the Federal Council setting out the views of the Council expressed at that meeting. Senator McLeay read the letter in full. He said that he hoped the Senate would pay particular attention to the letter. He then referred to other directions in which he thought the money earmarked for the pharmaceutical benefits scheme could be better spent—the provision of hospital accommodation, the eradication of tuberculosis, child welfare, housing and similar matters. On general principles he held that the Government would be well advised to postpone consideration of the measure until it had had an opportunity to formulate a comprehensive scheme of national insurance, which would cover old age, unemployment, medical benefits and so on. Asked whether he would support such a measure, Senator McLeay replied that he would, provided that it was on a contributory basis.

Senator H. S. Foll agreed that the measure began at the tail end of a health scheme. He pointed out that a person had to produce a prescription from a doctor before he could receive free medicine under the scheme, and that he could not receive a second bottle unless the medical practitioner had ordered one. He would prefer that the Government would grant a subsidy that would encourage people to seek early medical advice. Senator Foll referred to the effect of the proposed legislation on the friendly societies, and quoted a letter from the Grand Secretary of the Hibernian-Australasian Catholic Benefit Society, protesting against a statement by Senator Cameron that the friendly societies had never given benefits equal to the contribution received. Senator Foll held that this was incorrect, and quoted figures from 1930 showing that the society in question had spent since that year on benefit and services more than the amount it had received in contributions from members. He thought that the friendly societies of the country were doing an extraordinarily good job. In conclusion, Senator Foll said that he did not think the bill would grant relief to individual families.

Senator H. D. Cameron, Minister for Aircraft Production, said that the policy of the Government would benefit persons who were sufficiently intelligent to accept the benefits. He agreed that friendly societies did good work, but they had their limitations, and he pointed out that they were able to make the excess payments mentioned by Senator Foll by drawing on accumulated contributions. The friendly societies operated amongst 700,000 members, but the Government proposed to provide services for the whole of the community. The Government was not giving away anything for nothing when it provided free medicine, because the recipients of the benefits would actually be receiving a portion of what they contributed both directly and indirectly to consolidated revenue. Senator Cameron said that opposition to the scheme emanated from those whose minds were still back in the middle ages and whose primary consideration was profit. He thought that opposition to the measure from doctors and chemists was based upon the false assumption that free medicine or free medical attention would have the effect of reducing them to the level of wage-earners.

Senator Herbert Hays said that the people of the Commonwealth had not lagged behind those of any other country in passing legislation beneficial to the people. Australian general hospitals compared most favourably with those of any other country. No one was turned away from them because they could not pay fees. Senator Hays directed attention to the good work done by friendly societies and said that no better example of the brotherhood of man could be found. One direction in which the Government could help was that it might subsidize friendly societies so that the people who were below standard and whose premiums would be loaded by life assurance societies might share in their benefits. Senator Hays then referred to the efforts made by many industrial organizations to promote the welfare of employees. He asked whether the Minister could point to a case in which medical attention and medicine had been made contingent on the patient's answer to the question of whether he was in a position to pay for it or not. If the Government was really anxious about the welfare of people, it could embark on other activities directed against tuberculosis and to the care of children. The bill made obvious the desire of the Government to govern by regulation.

Senator R. H. Nash referred to the statement of the Leader of the Opposition, Senator McLeay, that the measure was one of the most remarkable pieces of legislation that had been placed before the Senate. Senator Nash was in entire agreement with this, because it struck right at the heart of the health economy of Australia. Senator Nash did not know whether the taking of medicine prescribed by medical men improved the health of the people, but medical practitioners had become highly skilled in prescribing and many thousands of people had implicit faith in their prescriptions. The Government was placing before Parliament another instalment of the security legislation for which it received a mandate at the last elections. Senator Nash thought that the granting of free medicine would induce thousands to seek medical advice whenever necessary, although they had probably neglected to do so in the past.

He also pointed out that under the provisions of the bill any public or private hospital would be able to provide patients with materials and appliances which were not actually pharmaceutical benefits. Referring to the formulary which was to be used, he understood that it would be so great that a doctor would have to be something of a wizard to prescribe something that was not contained in it.

Senator W. J. Cooper said that in recent years it had been increasingly recognized that a considerable number of factors affected public health, and that expenditure upon any one or all of them was justified not only on health but also on economic grounds, and would undoubtedly save cost in the future. The object of the bill was to provide free medicine to the people. The Senate had, the day previously, passed a measure which would provide unemployment, sickness and special benefits, and it had been stated that the Government intended to combine all legislation of this kind into one consolidated measure. That measure would be administered by the Director-General of Social Services. He therefore failed to understand why the measure under consideration was to be administered by the Director-General of Health. The bill provided for a consultative council consisting of six persons, and a council of that kind would be able to advise the Director-General of Social Services in regard to the medical side of the administration of the measure. Referring to the measure itself, Senator Cooper thought that better value could be obtained for the proposed expenditure. In very many cases of illness greater assistance than the right to obtain a bottle of medicine free of charge could be given. He then referred to tuberculosis, and he said that the Commonwealth should undertake to deal with diseases which were Commonwealth-wide, and from which the whole of the people of the Commonwealth required immediate protection. At the present time any person in necessitous circumstances could obtain medicine free of charge as an outdoor patient at a public hospital. Evidence given before the Committee on Social Security had revealed that the most urgent need of the sick was adequate free hospital treatment, and he believed that all energies and finance should be directed to that end.

Senator J. J. Arnold said that he was pleased that the Government had been able to supplement the Unemployment and Sickness Benefits Bill with the measure under consideration. The Government would be making a contribution towards social security even if, as Senator McLeay suggested, it started at the tail end. The fact that other reforms remained to be brought about did not detract from its value. The measure was an indication of the Government's determination to push on with a full social security plan as quickly as possible. One important effect of the measure would be to ensure that wholesome drugs were made available to the whole community. In the past people had tried to cure themselves by obtaining a patent medicine from the chemist, believing that it would do as the wording on the label suggested. The bill would assist to preserve national health by making it unnecessary for poor people to depend on quacks and patent medicines.

Senator J. A. Spicer said that senators would have some difficulty in finding a measure of less value to the community than the one under consideration. He said he would be interested to learn from the Minister for Health whether any responsible body had recommended the Government to adopt its proposal. Senator Spicer was not opposed to a well-conceived and properly balanced social services scheme, but the present was a sort of "catch as catch can" scheme which he suggested would not contribute in the slightest degree to the health of the community. Senator Spicer went on to discuss the constitutional aspect of the measure, and doubted whether the proposed law was one which Parliament was competent to pass. The measure, however, was not only unconstitutional, but also dangerous. The provisions of the bill could be used to bring the whole of the activities of chemists under the control of the Government. This, he thought, would be one of the greatest misfortunes which could befall the country, and he referred to the desire of the Labour Party to regiment everyone in the community. Referring to the consultative council that was proposed, Senator Spicer asked whether any of the six persons appointed to it would be likely to have any knowledge of the matters on which they were to be consulted. The same observation applied to the proposed formulary committee. The bill did not provide what that committee was to do or who were the people to constitute it. Parliament was asked to hand over the whole of the business to the Minister. The bill was based upon a system of control by regulation. Referring to proprietary medicines, Senator Spicer said that there was in the bill no provision which reduced the evil of people obtaining proprietary medicines at chemists' shops. They would still be able to buy them without obtaining a doctor's certificate. Senator Spicer did not believe that any social services scheme could be financially sound unless it was on a basis of national insurance with contributions from every member of the community who was to benefit, and if such a scheme were to be started, he hoped that a start would not be made by the provision of free medicine.

Senator W. E. Aylett did not think that the bill went far enough, but at least it was a start upon a long-range programme. After referring to the free medical service that had been provided in selected areas of Tasmania, he said that he would like to see inserted in the measure a provision whereby the Minister for Health could at some future date, should he or the Government deem such a course to be desirable, appoint medical practitioners to certain localities, where their services would be available to the people free of charge. Then, should the scheme work satisfactorily in these localities, it could be applied generally throughout the community, so that in the event of illness people could not only have free medicine but also free medical attention. All over the Commonwealth there were dispensaries conducted by friendly societies and miners' organizations, which provided the foundation of the socialization of medicine. There was no doubt that if control of these dispensaries was assumed by the Government, prescriptions could be dispensed at a much lower cost than would be the case under the present scheme.

Senator A. J. McLachlan said that the security of the fund by which the present scheme was to be financed was not assured. Why the Government sought to link this "free medicine bill" with some contribution that was being made under the taxation laws of the Commonwealth and also with the National Welfare Fund, he did not know. Before proceeding with legislation of this kind, the Government ought to be sure that the power of Parliament to pass such a law was undoubted. In regard to the bill itself, Senator McLachlan said that the Government should deal first with medical attention. The principal cost when a person was stricken with illness was not the cost of medicine, but the cost of medical attention.

Senator C. A. Lamp supported the bill. He insisted that it represented only one unit in the structure of a comprehensive social security scheme. He hoped that before long the Government would be able to introduce a hospital benefits scheme, which was the most important of all.

Senator Dorothy M. Tangney supported the bill. She agreed that any comprehensive scheme of social services should begin with a nationalized free medical service. Since she had been a member of the Committee on Social Security, she had been amazed at the need in the country for improved hospital facilities. She said that she welcomed the measure, because under its provisions it would not be possible for any person to be a malingerer or to secure medicine for any psychological or imaginary illness.

Senator J. W. Leckie said that the real tests of a measure of this kind were, first, whether it would do any good, and secondly, what it would cost. The Minister for Health had failed to explain either of these in his second reading speech. Senator Leckie thought that the bill should be described as a measure to provide free political pills for the people. The bill really provided a qualified patent medicine scheme. Talk about relieving the drain on the income of the poor was so much ridiculous talk.

Senator R. Darcey said that he supported the bill, because he thought it was one way in which to meet the disabilities which a family suffered when the breadwinner ceased to earn income because of illness.

Senator S. J. Large said that he was not scared by the talk of regimentation or the socialization of the means of production, distribution and exchange.

Senator J. M. Fraser, Minister for Health and Social Security, in reply, said that he wished to correct some of the statements made by senators who had opposed the bill. He quoted from a letter by Sir James Barr, published in the *British Medical Journal* in 1911, when the Lloyd George government of Great Britain introduced legislation to provide for a scheme of national insurance. In this letter Sir James Barr had stated that he thought the public should have opposed the bill and should try to upset it for a number of reasons. The reasons mentioned by Barr, Senator Fraser said, were similar to those advanced by Opposition senators in the present discussion. He added that the Government did not claim that the proposed legislation would improve the health of the community. The measure

was part of the Government's plan for a national health service. Senator Fraser also referred to a statement by the Prime Minister that the Commonwealth recognized its responsibility in respect of the whole field of public health. Senator Fraser hoped that before very long the Government, in cooperation with the States, would be able to implement all the health proposals enunciated by the Prime Minister in the policy speech before the last general election. He insisted that, because of the neglect of the tuberculosis problem by previous governments, the Government had a considerable leeway to make up. It could not be expected that all essential reforms would be provided immediately. The National Health and Medical Research Council had not yet presented its report on free hospital treatment, but immediately that report was to hand, the Government would give it urgent consideration.

The question was resolved in the affirmative, and the bill was read a second time.

At this stage the Senate went into committee.

In connexion with the clause dealing with the commencement of the act, Senator Fraser said in reply to a question that it would probably come into operation within a period of six months.

A discussion then took place around the non-application of the act to certain parts of the Commonwealth. Senator Fraser explained that it might not be possible to bring the measure into operation in certain portions of the Commonwealth, such as the Northern Territory and Norfolk Island. Objections were raised, and in response to a suggestion by Senator A. J. McLachlan, Senator Fraser agreed to postpone the clause so that its wording might be reconsidered.

The clause giving the general administration of the act to the Director-General of Health was agreed on.

Considerable discussion took place on the clause dealing with the provision of pharmaceutical benefits. The clause stated that pharmaceutical benefits referred to in the act should consist of uncompounded medicines set out in a prescribed formulary and of materials and appliances named in an addendum to the formulary. Senator K. C. Wilson moved that the following words should be added: "A cost exceeding an amount to be prescribed and such other medicines as are prescribed by a medical practitioner." He said that the amendment, if carried, would give to the medical practitioner the widest possible discretion in the prescription of medicines. He quoted an opinion expressed by Dr. F. W. Carter, a member of the Federal Council of the British Medical Association in Australia, dealing with the subject; and he said that as Parliament was not in the position to issue a blank cheque, he had included in his amendment "a cost not exceeding an amount to be prescribed".

Senator J. M. Fraser said that the Government would not accept the amendment. He added that the formulary would contain all of the approved drugs, and that the members of the committee would be either members of the medical profession or pharmaceutical chemists. He said that the belief that the doctor should remain unfettered and be allowed to prescribe according to his predilections for certain drugs showed a lamentable lack of appreciation of the Government's responsibility as custodian of the public purse. He added that if only one doctor examined the patient, it would be hard to disprove the medical view that the attending doctor was the only person who knew what should be prescribed for the patient. If, however, more than one doctor examined the same patient, the prescription of each doctor would not be identical, and therefore no doctor could claim that his particular formula was the only one that would meet the requirements of the patient.

Senator J. A. Spicer said that the Government proposed to regiment the medical prescriptions of the community. The Minister asked the committee to accept the position that the health of the community was more likely to be satisfactorily cared for by standardized prescriptions of a formulary committee than by a prescription recommended by a doctor to meet an individual case. Senator James McLachlan said that he took it that the committee would merely name the drugs that might be used in prescriptions and that a doctor would exercise his own discretion as to quantities. Senator J. M. Fraser said that the committee of experts would draw up the formulary, which would contain the most important drugs, regardless of their cost, and the medical practitioner would have to confine himself to the formulary. The doctors would be able to vary the quantities to be prescribed. Senator K. C. Wilson said that the clause tended to make the medical profession entirely static, and that it would be a retrograde step to leave the bill in its present form. Senator Herbert Hays said that the more the clause was discussed, the more confusing it became. He would like to know more of the nature of the committee to be set up, and how and by whom its members would be chosen. He thought the Government should have nothing to do with half-measures, and he pointed out that the basic principle of the bill was the provision of medicine free of charge to the public. Senator H. S. Foll referred to penicillin, and Senator Fraser repeated his assurance that no approved drug would be excluded from the formulary because of its cost. Senator Foll then said that the Government should follow New Zealand's example and stipulate that all drugs, regardless of cost, should be provided free of charge if they were prescribed by medical practitioners. Senator J. A. Spicer asked whether the Government seriously believed that a panel of doctors or chemists sitting in Canberra was likely to prescribe more appropriate medicine for an individual than the patient's own medical practitioner. Senator K. C. Wilson said that it was clear that the Government intended to provide only cheap medicine, which would be given as free medicine in order to appease the electors instead of to improve the health of the community. Senator J. M. Fraser replied that the Army War Pharmacopœia was the basis of the formulary accepted by practitioners in Australia. After further discussion, Senator Fraser said that the Government had no intention of selecting for membership of the formulary committee any person who had not had the widest possible experience. All combinations of drugs of therapeutic value would be included, and any variations the doctor might require in the matter of proportions could be made within the formulary itself. Senator James McLachlan said that if it was intended to prepare prescriptions for the treatment of various complaints, the prescriptions should be numbered and a person suffering from a condition should be able to go to his chemist and ask for "prescription number so-and-so". Senator A. J. McLachlan said that the attitude of the Minister appeared to be that the medical man who was in personal contact with the patient, knew his constitution and medical history and examined him frequently, was not to be trusted to prescribe what medicine was necessary for him.

The committee divided and the amendment was lost by a majority of one.

Clause 15 of the bill dealing with special arrangements for persons in isolated areas was as follows:

> (1) The Minister may make such special arrangements as he thinks fit for the purpose of providing that adequate service in lieu of all or any of the benefits provided for by this act will be available to persons living in isolated areas or under such special conditions that those benefits cannot be efficiently provided in accordance with the general provisions of this act.
>
> (2) Where special arrangements are made in accordance with the last preceding subsection, any provisions of this act inconsistent therewith shall not be applicable in relation to the persons provided for by the special arrangements.

Senator Fraser moved that the following new clause be inserted:

> 15A. *Arrangement for the Provision of Medical Services.*
>
> The Minister may, on behalf of the Commonwealth, enter into an agreement (on such terms as to remuneration, allowances and otherwise as he thinks fit) with any medical practitioner providing that the services of the medical practitioner shall be available without charge to members of the public for the purpose of furnishing prescriptions and orders for the purposes of this act.

Senator G. McLeay regarded the conduct of the Minister in moving this amendment as extraordinary. It would give into the hands of the Minister for Health the power to declare that his own friends should have free medical attention. Senator J. M. Fraser replied that the clause was designed to cover emergency cases. The Minister might decide that it was in the interests of a particular section of the community, particularly people in an outback district, who might have to travel miles to get a prescription, that medical attention should be provided. If it were the intention of the Government to do as Senator McLeay suggested, it could easily appoint medical practitioners under the *Public Service Act*. In reply to a question, Senator Fraser said that the new clause was merely remedying an oversight in the drafting of the bill. Senator J. A. Spicer said that it was easy for the Minister to say that he should have power to supply prescriptions to persons in isolated areas; but the clause was not so limited. The Minister was

taking to himself the power to make his own laws. He was asking for power to determine whether certain sections of the community should be able to get free medical treatment. The clause provided no limit whatever to the Minister's discretion. Senator W. E. Aylett said that the clause would empower the Minister to appoint doctors for the whole of Australia, should the Government think fit to do so. Senator Aylett declared that he would not balk the issue, and he would not be satisfied until free medical attention was provided for the whole of the Australian people. Senator J. W. Leckie pointed out that the measure did not envisage medical benefits in the full sense of the term. All that it provided for was medical advice and the supply of medicine.

Senator H. S. Foll said that, dealing with the proposed new clause, Senator Aylett had interpreted the intention of the Government far more accurately than the Minister for Health had done. If the Government intended to go further and subsidize the medical profession, it should go further and make that principle the subject of a special measure. Senator Foll said that he would support the clause, provided that the Minister would restrict the application of the provision to the conditions which he set out in his explanation of it—that it should apply only to people in outback or isolated areas, where medical practitioners were not available in ordinary circumstances. Senator G. McLeay said he would like to hear whether the Minister would consider an amendment on the lines suggested by Senator Foll. Senator J. J. Arnold said that there were in the community people who would not be covered by friendly societies and other organizations, and who should not be debarred from receiving medical attention free of charge; for this reason the proposed new clause was to be inserted into the bill. Senator H. S. Foll moved that after the word "public" the following words should be inserted: "living in isolated areas, or under such special conditions that the benefit of the act cannot be effectively provided". Senator Fraser said that the Government could not accept Senator Foll's amendment. He could not see why the Government should have limitations placed upon its actions. Senator J. W. Leckie said that the proposed new clause would enable the introduction of a complete scheme of free medical benefits without prior consultation with medical men, the Treasurer or Parliament. An attempt was being made to insert an amendment which might involve expenditure amounting to three times the cost of the original scheme. Senator J. A. Spicer said that the least that could be expected was that the Minister for Health would give some reasons for his opposition to the amendment. The proposed new clause would enable the Minister to extend benefits to some people and not to others. He thought that the committee was entitled to some explanation from the Minister as to what he intended to do should the clause become law.

At this stage Senator Foll rose to a point of order regarding the title of the clause. After some discussion he moved a dissension from the chairman's ruling. The chairman said that he would report the dissension from his ruling to the President of the Senate.

In the Senate the chairman of committees reported to the President that Senator Foll had moved dissension from his ruling. The point in question was debated and the President upheld the ruling of the chairman of committees.

In committee Senator Foll's amendment was put. The committee divided and the amendment was lost by a majority of one. The new clause (15A) was agreed to.

In regard to the clause dealing with the appointment of a formulary committee, Senator K. C. Wilson moved an amendment which specified that two of the six persons appointed by the Minister should be practising medical practitioners, two should be practising pharmaceutical chemists and one a pharmacologist. Senator J. M. Fraser said that he would accept this amendment, but pointed out that it might be difficult to induce a pharmacologist to become a member of the formulary committee. Senator Wilson thereupon suggested that the words "if available" should be introduced into the amendment. This was accepted by Senator Fraser, and the amendment as amended was agreed to.

Clauses dealing with the pharmaceutical benefits committee and offences were agreed to.

The postponed third clause was discussed and Senator Fraser moved an amendment which was agreed to.

During the passage of the third reading of the bill, some discussion of friendly societies took place.

Naval, Military and Air Force.

CLINICAL MEETING AT AN AUSTRALIAN GENERAL HOSPITAL.

A CLINICAL MEETING was held at an Australian general hospital on December 19, 1943. COLONEL KIRKWOOD, the Commanding Officer, presided and welcomed guests of the allied forces and local medical practitioners. Part of this report was published in the issue of March 18, 1944.

Carcinoma of the Larynx.

MAJOR B. B. BLOMFIELD showed a patient suffering from carcinoma of the larynx, who had been treated by laryngofissure. The patient, a captain, aged fifty-three years, had been admitted to the hospital on May 19, 1943, and a direct examination of the larynx was made. It was noticed that practically the whole of the right vocal cord appeared to be involved by newgrowth, with actual ulceration only at the centre, and the condition did not appear to extend below the edge of the cord. Several small pieces taken from the edge of the growth were examined microscopically. The report on these was as follows: "Squamous epithelioma—this appears to be quite extensive, and present in all the pieces of tissue submitted." A preliminary tracheotomy was performed on June 1, and then a laryngofissure operation was undertaken. The whole of the right cord and the anterior one-third of the left cord were removed. The removal of at least 0·5 centimetre of what appeared to be healthy tissue on all sides of the affected area (except in depth) was attempted. The thyreoid cartilage appeared healthy, and the soft tissues were not attached to the underlying cartilage. After operation a suction apparatus was set up beside the patient's bed for the removal of secretions through the tracheotomy opening and from the pharynx. "M & B 693" or "Dagenan" was given for three days. The patient had great difficulty in swallowing for some days, and could not drink without great difficulty for about two weeks; even after four weeks he still had some difficulty.

Major Blomfield emphasized the following five points: (i) To ensure early diagnosis of carcinoma of the larynx, every case of persistent hoarseness must be diagnosed as one of a carcinoma until it was proved not to be so by direct examination and by pathological examination of tissue removed at biopsy. (ii) The degree of malignancy did not affect the indications for operation. (iii) Indications for operation were affected only by the extent of involvement. (iv) Even when the growth affected the anterior commissure, laryngofissure was still feasible. (v) Provided that from 0·5 to 1·0 centimetre of healthy tissue could be removed in one piece from above, below, in front and behind the growth, operation by the laryngofissure method was indicated; otherwise the total laryngectomy operation was called for.

Fracture of the Pelvis.

MAJOR MUNRO S. ALEXANDER showed three patients who had sustained fractures of the pelvis, which had associated complications. The first soldier, aged thirty-eight years, had been knocked down by a motor-truck six months earlier; he had sustained a fracture-dislocation of the left hip joint with displacement of a portion of the acetabulum and the head of the femur upwards and backwards, fractures of both ischio-pubic rami, a fracture of the ramus of the right ischium, separation of the *symphysis pubis*, multiple abrasions and lacerations, a large hæmatoma of the left gluteal region, right peroneal palsy and a mild urethral injury. Reduction of the dislocation was obtained by twenty pounds' traction applied to the left leg, and rotary skin traction was applied to the thigh to obtain slight internal rotation of the femur to assist in reduction. The traction was maintained for a period of six weeks, and full reduction of the femoral head was obtained, but not of the acetabular fragment. Then a full plaster hip spica was applied, care being taken to maintain the reduction of the dislocation during its application. The spica was removed after a further two months, and the patient was allowed to walk in a well-fitting caliper, all weight being taken on the ischial tuberosity; this he did for a further seven weeks. For the last three weeks he had been walking without mechanical support. At the time of the meeting, six and a half months after his original injury, he walked with a slight limp, but painlessly, despite the severe traumatic osteoarthritis of the left hip joint. Some slight new bone formation was to be seen radiologically around the acetabulum, and the other pelvic fractures were well united.

The movements of the hip joint were limited to 10° of flexion and about 5° of adduction and abduction. Flexion of the left knee joint was limited to 30° and was still improving.

Major Alexander pointed out that the chief interest in this case lay in the fact that the reduction had been maintained, contrary to expectations, after weight-bearing. No open operation had been performed, and he considered it doubtful whether any better result could have been produced by open operation. The restricted knee movements which had resulted from the prolonged period of immobilization, and which might have been minimized somewhat by putting the knee through a full range of movements during the first six weeks, did not appear to be much handicap to the patient, since his hip joint movements were so greatly limited.

Major Alexander then showed a soldier, aged twenty-eight years, who four months before had sustained a fracture of the left ischium involving the ischial spine; a spicule was found to be perforating the rectum. A colostomy was established and the extraperitoneal space on the left side was drained. Three months prior to the meeting an abscess of the left groin was drained, and three days later septic arthritis of the left hip joint and osteomyelitis of the left ischium were noted. The hip joint was drained four weeks later. Radiological examination two weeks later again revealed partial destruction of the head of the left femur with complete ankylosis of the left hip joint and slight external rotation of the femur. Two weeks prior to the meeting the patient was placed in a plaster spica. Major Alexander said that the object of showing this patient was to demonstrate an unusual sequence of events following injury to the bony pelvis. The general toxæmia following the bone and joint infection had been severe. There was a possibility that the ankylosis with external rotation of the femur would necessitate osteotomy for its correction at a later date.

Major Alexander's third patient was a soldier, aged twenty-one years, who four months before had been crushed by a fall of gravel in a pit. He sustained a Colles's fracture of the forearm, multiple fractures of the pelvis and a rupture of the urethra. The left half of the pelvis was tilted downward and outward. As catheterization was not possible, a suprapubic cystostomy was established; the urethra was found to be torn below the apex of the prostate, and following the use of metal sounds a rubber catheter was manipulated into the bladder through the urethra, and tied in position. The suprapubic tube was left in position for two weeks, and the urethral catheter for a further two days. Three months prior to the meeting the patient had developed a renal tract infection, which was successfully treated by the oral administration of sulphonamides and fluids. For the last two and a half months periodic instrumental dilatation of the urethra had been performed. Two weeks prior to the meeting several small sequestra had been removed from the *symphysis pubis*. On the day of the meeting the patient could walk with ease; the wound over the symphysis was almost healed, and no urinary infection was present. The appearances in a urethrogram taken the previous day were within normal limits. Major Alexander said that he showed the patient to demonstrate the end-result of severe damage to the bony pelvis, which, despite the grossly abnormal configuration still existing, left the patient symptomless. The completely torn urethra had healed well, and further treatment would consist of the passage of sounds at lengthening intervals.

Thrombocytopenic Purpura.

CAPTAIN L. V. MERCHANT showed a patient, aged twenty-two years, who was suffering from essential thrombocytopenic purpura. There was nothing of note in his past history, except that he had always bled freely from the nose (from a slight injury or from forcibly blowing the nose) and from dental extractions. He stated that his mother had the same tendency, but in a milder degree. One brother and one sister were alive and in normal health. The present illness began on September 10, when he observed a number of painless discrete spots on the dorsum and edge of his tongue. They were of a reddish-purple hue. These gradually disappeared, but had recurred. Since the onset numerous similar lesions had from time to time appeared on the arms, chest and legs, and he had had many epistaxes. When he was first examined at a hospital on September 15, purpuric lesions were present. The spleen was not palpable. A blood count gave the following result: the erythrocytes numbered 5,810,000 per cubic millimetre and the hæmoglobin value was 13·5 grammes *per centum* (93%); the leucocytes numbered 5,750 per cubic millimetre, 63% being neutrophile cells, 1% basophile cells, 3% eosinophile cells, 23% lymphocytes, and 10% monocytes. The coagulation time was three and a quarter minutes and the bleeding time twenty minutes. No platelets were seen in the counting of 1,000 erythrocytes. On September 26, the blood platelets numbered 10,000 per cubic millimetre. The number of erythrocytes and the hæmoglobin value gradually sank to 3,700,000 per cubic millimetre and 79% respectively. Two blood transfusions were given.

The patient was admitted to the present hospital on December 1, 1943. His condition was good. The spleen was just palpable on inspiration. Numerous petechiæ and ecchymoses were present on both feet and legs, as well as purpuric lesions on the tongue. The tourniquet test for capillary fragility gave a strongly positive result. The erythrocytes numbered 4,500,000 per cubic millimetre and the hæmoglobin value was 12 grammes *per centum*; the leucocytes numbered 6,100 per cubic millimetre, 64% being neutrophile cells, 1% eosinophile cells, 30% lymphocytes and 5% monocytes. The coagulation time (Wright) was six minutes (normal, six to ten minutes). The bleeding time (Duke) was over thirty-five minutes (normal, two to five minutes). The blood platelets numbered 55,000 per cubic millimetre. The clot retraction was delayed, but was not strikingly abnormal at five hours. At twenty-two hours it was decidedly abnormal, as no further contraction had taken place. The clot was extremely friable. This feature was demonstrated by Captain H. Boyd Penfold, who compared the clot with that in blood from a normal person.

A chart exhibiting the results of all the blood counts was shown. The patient's condition was regarded as a typical example of essential thrombocytopenic purpura. Certain features in the clinical course and blood picture were pointed out as enabling the diagnosis to be made from aplastic anæmia, aleuchæmic leuchæmia and other conditions. It was considered that splenectomy was indicated.

(To be continued.)

Medical Practice.

LIABILITY FOR MEDICAL SERVICES RENDERED TO MEMBERS OF CIVIL CONSTRUCTIONAL CORPS.

THE following statement is published at the request of the Assistant Director of Personnel of the Allied Works Council.

Attention is drawn to the limits of liability of the Allied Works Council for payment of medical services rendered to members of the Civil Constructional Corps.

Eligibility for treatment (except in the case of accident) is limited to members who are required by the Allied Works Council to live away from their usual place of residence. No liability will be accepted for services rendered to members living at home, except in those cases where a claim for compensable disability is accepted by the Council.

Eligible members requiring medical attention from a civil medical practitioner must obtain, for each visit, written authority to receive such attention, otherwise the Council will not be responsible for the medical expenses incurred. Each visit must be authorized. In cases of emergency, authority may be anticipated, but must subsequently be confirmed.

The original of such authority should be handed to the practitioner who is required to attach this to his account for services rendered when submitting for payment.

Authority to render medical service to eligible members of the Civil Constructional Corps will be issued either by the officer in charge of a medical aid post, camp manager, personnel officer, the senior officer in charge of a project, or in the absence of any of these officers, by the contractor or his representative.

Payment for services will not be made in excess of the scale set out in the schedule contained in National Security (Medical Co-ordination and Equipment) Regulations published in the *Commonwealth of Australia Gazette* on August 26, 1942 (Number 230 of 1942).

Specialists' fees will only be admitted if the service rendered was authorized by the Deputy Director of Medical Services. In cases of emergency, authority may be anticipated, but must be subsequently confirmed.

Fees for specialists, consultants, X-ray and pathological reports will only be accepted if at the ruling rate for the district. In no case shall these exceed the scale of fees drawn up by the Commonwealth Health Laboratories dated September 1, 1937.

No liability will, in any case, be accepted for treatment which has not been authorized as set out above.

National Emergency Measures.

ECONOMY IN THE USE OF X-RAY TUBES.

THE following memorandum is published at the request of the Chairman of the Medical Equipment Control Committee.

Although every effort is being made to maintain an adequate supply of X-ray tubes to Australia, it is becoming increasingly important that all tubes now in use should be operated under conditions which will ensure their maximum possible life. The Medical Equipment Control Committee has recently had notes prepared on the care of X-ray tubes and on the interpretation of rating charts; these have been distributed to X-ray units within the services, and copies may be obtained by civilian users of X-ray tubes on application to the committee at 31, Albert Road, Melbourne, S.C.2.

In discussing means by which the life of X-ray tubes may be extended, a leading manufacturer has drawn attention to the advantages of immobilization of the patient wherever possible. In bone radiography, immobilization by compression bands, head clamps, sand bags *et cetera* enables the exposure to be prolonged so that a much smaller tube current is required. This results in much less damage to the fine focal spot necessary in this work. Immobilization has the added advantage that the number of repeat radiographs is reduced, thus saving the tube as well as X-ray film.

When owing to organic movement the radiograph must be taken in a reasonably short time, care should be taken that the maximum permissible load is not exceeded. When the maximum permissible load is given, tube damage is avoided only if the exposure timer, circuit contactors *et cetera* are operating with absolute efficiency. Some tube manufacturers believe that a fair life for a diagnostic tube is 5,000 maximum load exposures, but that if only 75% of the maximum load is delivered, the life increases to 30,000 exposures or more.

When such economies are possible, the careful study of tube rating charts and the systematic planning of radiographic exposures are strongly recommended.

Correspondence.

THE FEDERAL COUNCIL AND ITS POWERS.

SIR: Ordinary members of the Association are at a disadvantage in making comments on the doings of the Federal Council, as the doings of that body are not fully known, the news being such (as you say in your leading article), "as to provide only the pabulum with which members of the Association should try to appease their appetites".

It is possible then that the members of the Council will have already given matters to which I wish to draw attention full consideration, and will report upon them to Branch Councils, if not to ordinary members. The matters to which I refer are as follows:

1. The Federal Council already possesses considerable powers, and one that is likely to be most important in the future is that exercised under Article 25B of the Articles of Association, namely: "It shall be the medium of communication with the Government of the Commonwealth on behalf of the Branches collectively . . ." In exercising this power care should be taken to see that the Council deals with the Federal Government directly, not making arrangements with one of its departments only.

2. While it is true that the Council cannot bind a Branch to a particular line of action, the Council, in acting for a majority of Branches in a federal matter, would be in a very strong position; Branches holding a minority view would have the right to have their case put to the Federal Government. They would need to have a particularly strong case to receive differential treatment. It is well to keep in mind Mr. Churchill's remarks in one of his speeches to the effect that democratic institutions take action on majority decisions, not necessarily unanimous ones.

3. Changes in the constitution of the Federal Council may be necessary with future changes in the Commonwealth Constitution affecting public health.

4. It may be very interesting to take action in the near future to improve the machinery whereby the objects of the British Medical Association in Australia may be more easily attained—for example, when medical congresses are resumed (and the sooner the better) it should be a simple matter to arrange for "Annual Meetings" of the members of the Association in Australia.

5. It would be very useful to have a fuller account than appears in the journal of Dr. Bell and Dr. Simmons's ideas for an Australian Medical Association (British Medical Association).

6. It would be useful to have definite information as to how the British Medical Association in South Africa has succeeded in overcoming difficulties of space and time in the organization that they have adopted.

Yours, etc.,

639, Sandgate Road, Clayfield, Queensland. March 17, 1944. E. S. MEYERS.

HYPERTROPHY OF THE PROSTATE AND SYNTHETIC ŒSTROGENS.

SIR: Some confusion evidently exists in the minds of at least a few medical men, following the publication of reports of benefits, and apparent cures, of prostatic cancer after treatment with synthetic œstrogens. This has led to several cases of benign prostatic hypertrophy, within my knowledge, being treated with stilbœstrol. The generally accepted explanation of this condition is that it is due to a decline in testicular secretion which results in a relative excess of œstrogen in the blood. This has been supported clinically by hormone estimations in the urine of these patients. Hence its treatment is diametrically opposite to that of prostatic cancer, which is adversely influenced by excess of testicular secretion. Obviously, then, stilbœstrol and other œstrogens are contraindicated in benign hypertrophy of the prostate.

Yours, etc.,

Golden Square, Bendigo, March 17, 1944. P. GOODMAN.

STERILITY.

SIR: In your issue of March 11 Dr. Coghlan states, on the basis of a very small number of cases, that there is an increase in male sterility. He has found some cases with unsatisfactory sperm counts and a high proportion of such men were soldiers.

He gives no evidence that this condition is permanent in these men, and there are a number of factors which can give rise to temporary aspermia, none of which appear to have been excluded in his cases.

From this sketchy and inadequate material Dr. Coghlan makes the remarkable assumption that a lack of vitamin *E* in the soldiers' diet has caused sterility in some of them, a suggestion which is admirably calculated to lower the morale of the army and cause distress to many men and women.

It is known that lack of vitamin *E* causes degeneration of the spermogenic cells of the testicle in rats, but evidence of need for this vitamin in other species is indirect and controversial, while there is no evidence whatever that it has any such effect on man.

The sources of vitamin *E* in the diet supplied to troops are essentially the same as those to which they are accustomed in civil life, and there is no reason to believe that there has ever been a shortage.

It is true that for short periods and under special conditions in forward areas some troops have had to live on a diet which was low in vitamins, but there was never a deficiency of beef, which is a good source of vitamin *E*, and this vitamin is stored in the body for long periods so that deprivation for a short time is not important.

Cases showing clinical signs of deficiency of any vitamin have been few, and now both the standard and the operational ration contain wheat germ or wheat meal and considerably more vitamin *B* than is required by any international standard and much more than the vast majority of Australians eat in civil life. There is every reason to believe that the army diet has always contained enough vitamin *E*, and certainly it contains ample now, so that even if this substance has any importance at all in the reproductive function of the human male, which is quite unproven, the soldier is well provided for, so that the publication of the suggestion that the fertility of the best men of the nation is being endangered by faulty diet is scientifically preposterous and morally indefensible.

Yours, etc.,

S. ROY BURSTON, Major-General,
D.G.M.S.

Allied Land Forces,
Headquarters,
Victoria Barracks,
Melbourne.
March 18, 1944.

TWO CLINICAL OBSERVATIONS.

SIR: When Corrigan described the accentuation of pulsation of the closed hand in cases of aortic regurgitation, he stated that this was due to the return of blood to the ventricle during diastole and adumbrated the finding of a low diastolic pressure in these cases. The pulsation reaches its peak when the wrist is raised to a height above the heart just greater than the diastolic pressure measured as a column of blood.

When a class in clinical physiology was discussing this proposition at the bedside, a third year student, Mr. J. Raynor, suggested that the Korotkow sounds should appear at this point. On trial this was found to be the case, and they proved also to be audible in a case of crural arteriosclerosis when the leg was raised. The stethoscope can therefore be used to confirm the findings of palpation and colour changes in such conditions.

Another sign, of some interest in intravenous administration, was found when idly tapping my medial malleolus; the tips of the fingers of the other hand were resting on the adipose tissue over the saphenous vein at about the level of the bulge of the calf of the leg. With each tap on the vein at a lower level a pulsation was felt at the higher level. Evidently the action of the valves of the vein made each tap give a pulse of blood in the direction of the heart. Such pulsation allows more accurate localization of the vein in adipose tissue than can be obtained by palpation.

Yours, etc.,

R. DOUGLAS WRIGHT,
Professor of Physiology.

Department of Physiology,
The University of Melbourne,
Melbourne.
March 16, 1944.

Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Bland, Campbell Young, M.B., 1937 (Univ. Sydney), Waterfall Sanatorium, Waterfall.

Saunders, Gladys Marie, M.B., B.S., 1939 (Univ. Melbourne), The Rectory, Tarcutta.

Barrie, Ian Reynolds, M.B., B.S., 1940 (Univ. Sydney), 2, Derby Street, Vaucluse.

Books Received.

"Rehabilitation, Re-Education and Remedial Exercises", by Olive F. Guthrie Smith, M.B.E., C.S.M.M.G., T.M.G., with a foreword by Lord Horder, G.C.V.O., M.D., F.R.C.P.; 1943. London: Baillière, Tindall and Cox. 8" × 6¼", pp. 432, with 268 illustrations. Price: 25s.

"Illustrations of Regional Anatomy", by E. B. Jamieson, M.D.; published in seven sections; Fifth Edition; 1944. Edinburgh: E. and S. Livingstone. 8" × 6¼". Price: 75s. net. Postage 10d.

"The 1943 Year Book of General Surgery", edited by Evarts A. Graham, A.B., M.D.; 1943. Chicago: The Year Book Publishers, Incorporated. 7" × 4", pp. 736, with illustrations. Price: $3.00.

Diary for the Month.

APR. 4.—New South Wales Branch, B.M.A.: Council Meeting.
APR. 5.—Victorian Branch, B.M.A.: Branch Meeting.
APR. 5.—Western Australian Branch, B.M.A.: Council Meeting.
APR. 11.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
APR. 11.—New South Wales Branch, B.M.A.: Organization and Science Committee.
APR. 11.—Tasmanian Branch, B.M.A.: Branch Meeting.
APR. 14.—Queensland Branch, B.M.A.: Council Meeting.
APR. 14.—Victorian Branch, B.M.A.: Ethics Subcommittee.
APR. 17.—Victorian Branch, B.M.A.: Hospital Subcommittee.
APR. 17.—Victorian Branch, B.M.A.: Finance Subcommittee.
APR. 18.—New South Wales Branch, B.M.A.: Medical Politics Committee.
APR. 18.—New South Wales Branch, B.M.A.: Ethics Committee.
APR. 18.—Victorian Branch, B.M.A.: Organization Subcommittee.
APR. 19.—Western Australian Branch, B.M.A.: Branch Meeting.
APR. 20.—New South Wales Branch, B.M.A.: Clinical Meeting.
APR. 20.—Victorian Branch, B.M.A.: Executive Meeting.
APR. 26.—Victorian Branch, B.M.A.: Council Meeting.
APR. 27.—New South Wales Branch, B.M.A.: Branch Meeting.
APR. 28.—Queensland Branch, B.M.A.: Council Meeting.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phœnix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia.

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